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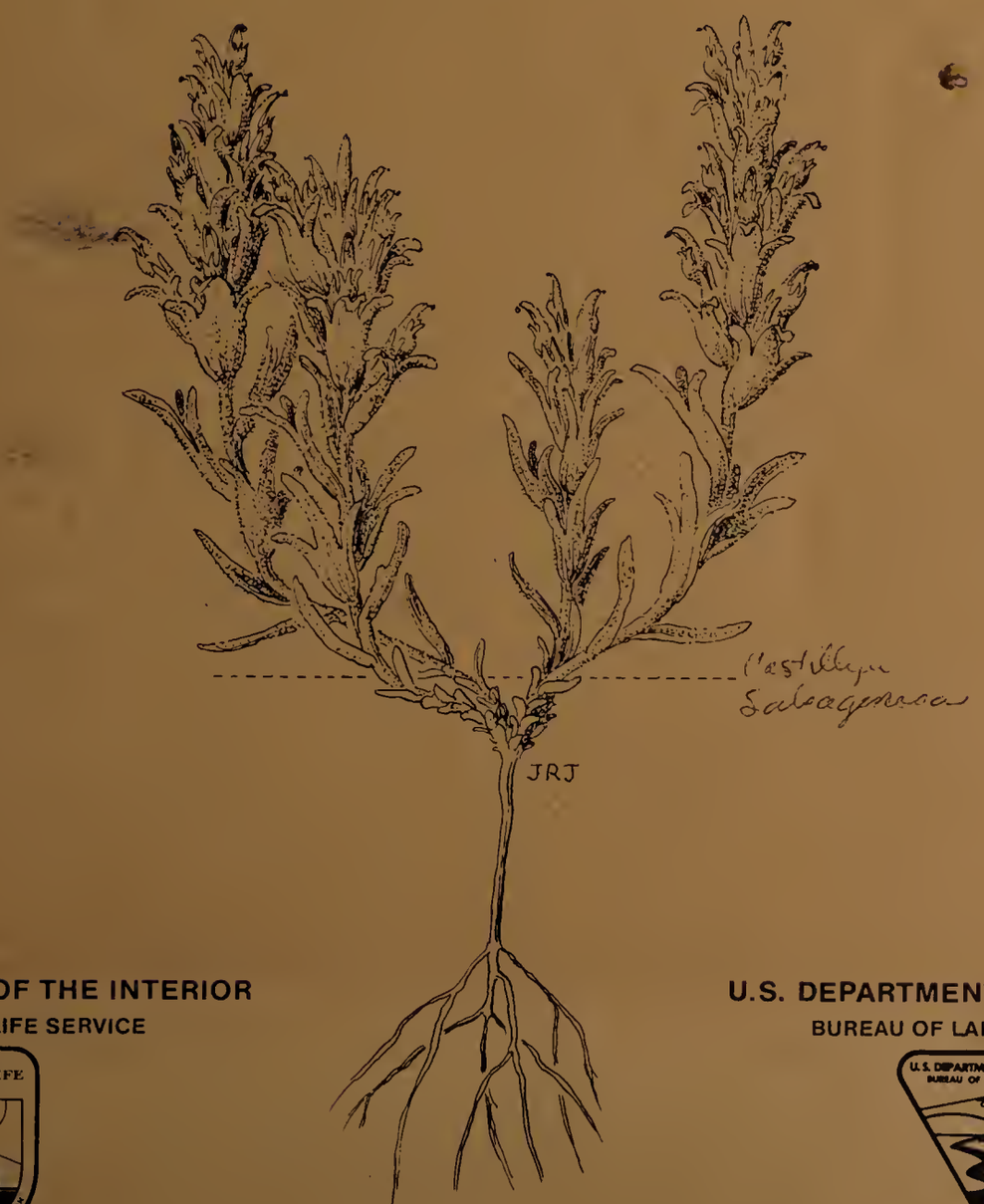
THREATENED AND ENDANGERED PLANTS OF NEVADA

An Illustrated Manual



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This volume should be cited in the literature as follows:

Mozingo, Hugh N. and Margaret Williams. 1980. Threatened and endangered plants of Nevada.
Includes index.
1. Botany - Nevada - Endangered species.

ID 88069655

Heather Grosberg

QK
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M69
1981
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THREATENED AND ENDANGERED PLANTS OF NEVADA

An Illustrated Manual

submitted to

U.S. Fish & Wildlife Service
500 NE Multnomah Street
Portland, Oregon
97232

and the

U.S. Bureau of Land Management
Nevada State Office
300 Booth Street
Reno, Nevada 89509

by

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and

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funded by

U.S. Fish and Wildlife Service
Bureau of Land Management

May, 1980

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Cover: *Castilleja salsuginosa*

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INTRODUCTION

With the passage of the Federal Endangered Species Act of 1973, considerable impetus was given to raising the general level of consciousness and concern over the rapidly dwindling populations of rare plants and animals both in this country and abroad. This manual is a direct consequence of that concern evinced by a variety of individuals and agencies in the state of Nevada.

Three T/E (threatened and endangered) plant workshops have been held in Reno. The first of these, in February 1978 under the leadership of Duane Atwood, was sponsored by the US Fish and Wildlife Service, the Bureau of Land Management, the US Forest Service, and the Northern Nevada Native Plant Society. The later sessions were under the sponsorship of the Northern Nevada Native Plant Society. These sessions involved the active participation of representatives from federal and state agencies as well as professional and amateur botanists familiar with our regional vegetation. The workshops provided essential contacts between the large number of field workers who have been active in attempting to understand the state's vegetation and those interested in collating and organizing this information in a form which could be readily disseminated. It is evident that there has been a dramatic increase in our knowledge of many rarer species, particularly in terms of a better understanding of habitats and associated species, as well as improved distribution records which were a direct consequence of the workshops. A large measure of the credit for the success of the latter two meetings must go to Ann Pinzl, Curator of Biology at the Nevada State Museum, Carson City, who organized and chaired these sessions and attended to the plethora of details needed to make them run efficiently.

Increased information has meant that the acknowledged status of many species has changed abruptly over the past several years. Many previously regarded as endangered are now thought to be only threatened, some have been deleted from our concern for one reason or another, while many others have been added to the list of species under consideration in Nevada. However, as perusal of the manual will show, there is still a great paucity of information about most of our uncommon species. So much so, in fact, that this effort must be regarded only as an interim document designed primarily to assist field workers in their efforts to learn more about Nevada's plants.

The authors' original intention was to illustrate and describe only the threatened and endangered plant species and to briefly treat the others, which for various reasons did not merit the full treatment, in a supplementary section. However, during the approximately eighteen months the manual was in progress, it became apparent that this was a virtually impossible goal. The recommended status of many species changed as a result of additional explorations, altered taxonomic views, and the discovery of mistakes in the original and subsequent listing of T/E species for the state. Unavoidably, then, this manual includes a full treatment for some plants which have been reduced to the watch list while a few recently recognized T/E forms are not fully treated either because the actual specimens were not available or because they constitute new taxa which had not been described in time for inclusion. Rather arbitrarily, we decided to include the full treatment of those plants for which the illustrations had already been prepared, even though some of these have now been deleted from consideration as recommended threatened or endangered plants. We felt that even the deleted forms are still relatively uncommon plants and the uniqueness of the illustrations for these would be of scientific value and of some interest. It should be added

that our characterization under "STATUS" is, however, only a recommendation and is based upon the latest information available at the time the manual went to press.

Although our categories of threatened, endangered, etc. are not yet officially recognized on the federal level for any Nevada plants, the State of Nevada Division of Forestry within its jurisdiction provided by NRS 527.270 validated a list of 18 plants, 14 Feb 1979, as threatened with extinction. Also, under "STATUS," the abbreviation "1975 *FR*" refers to the *Federal Register* of 1 July 1975 which was a notice of review of status of over 3,000 vascular plants proposed by the US Fish and Wildlife Service. "1976 *FR*" refers to the *Federal Register* of 16 June 1976 which listed proposed endangered status for some 1,700 vascular plant taxa, however, this expired on 10 November 1979. Plants which are not considered to be immediately threatened or endangered, but which need to be monitored have been placed on a "watch list." Such a list has been termed in various ways, including a list of plants of special concern or sensitive plants. Although many of these plants have been considered at all the T/E workshops held in Reno, only the most recent recommendations from these workshops are listed. New information has been received recently for a few taxa and our recommended status for these differs from that recommended at the workshops. We have indicated our recommendation by following it with our names in parentheses, i.e., (Mozingo and Williams).

Under "LAND OWNERSHIP/MANAGEMENT," the following abbreviations are used for federal agencies: BLM - Bureau of Land Management, DOD - Department of Defense, DOE - Department of Energy, USFS - US Forest Service, and USFWS - US Fish and Wildlife Service.

Probably the most difficult category to assess properly is that of "THREATS," given the low level of development of most of the State's acreage and our inability to predict even the immediate future. On this score, particularly troublesome is the lack of data which would allow us to assess even crudely the impact of the proposed MX system of the US Air Force on a significant portion of the State's flora. The authors, however, believe that enough information is available to categorically state that the MX system as presently envisaged will be a disaster for much of the State's flora, although it is impossible to say at this time which species will be most jeopardized.

A manual such as this obviously depends on the efforts of a large number of people. Several have contributed in such significant measure that our task would have been much more difficult, if not impossible, without their help. We are especially grateful to Ann Pinzl, who in her capacity as Curator of Biology at the Nevada State Museum has used her office as a clearing house for all of the distribution records for T/E species in the State. We depended quite heavily on the routine transmissions from her files, as well as the workshops, mentioned earlier, which she organized. In addition, Ann contributed most of the land ownership/management data included in the manual.

The sustained interest, advice, and sponsorship of Janet Hohn of the USFWS and particularly her patience with our sometimes meandering efforts are directly responsible for this manual which began as her idea. Her expert guidance in the preparation of the manuscript resolved many of our problems which otherwise might have proved insuperable. We are particularly indebted and grateful to her for making this manual possible.

Completion of this work occurred through the interest and support of Don Spalinger of the BLM. We especially appreciate his useful suggestions. With the added funds provided by the Bureau, continuation of this work was assured.

We are also very grateful to Joseph Dowhan of the Sacramento office of the USFWS. He has been of significant help in resolving many of the problems we encountered.

Many people devoted time to checking plant identifications and illustrations. Particularly outstanding in this regard was the contribution of Rupert Barneby and James Reveal. The opportunity to have our material checked by two such eminent botanists cannot help but enhance the value of our work. We are especially appreciative of their help.

We believe that there can be little argument with the thesis that the value of a manual such as this depends largely upon the number and quality of its illustrations. Much of what we have said about T/E plants is subject to dispute and inevitably much will change. But the quality and value of a good scientific illustration always endures. We feel extremely fortunate in having been able to enlist the services of two of this country's foremost botanical illustrators for this work, Jeanne R. Janish and Peggy Duke. The efforts of both of these very talented artists accomplishes the very difficult twin goals of scientific exactness and aesthetic satisfaction. Any permanent value which this work may have will be due exclusively to the beauty and accuracy of its illustrations.

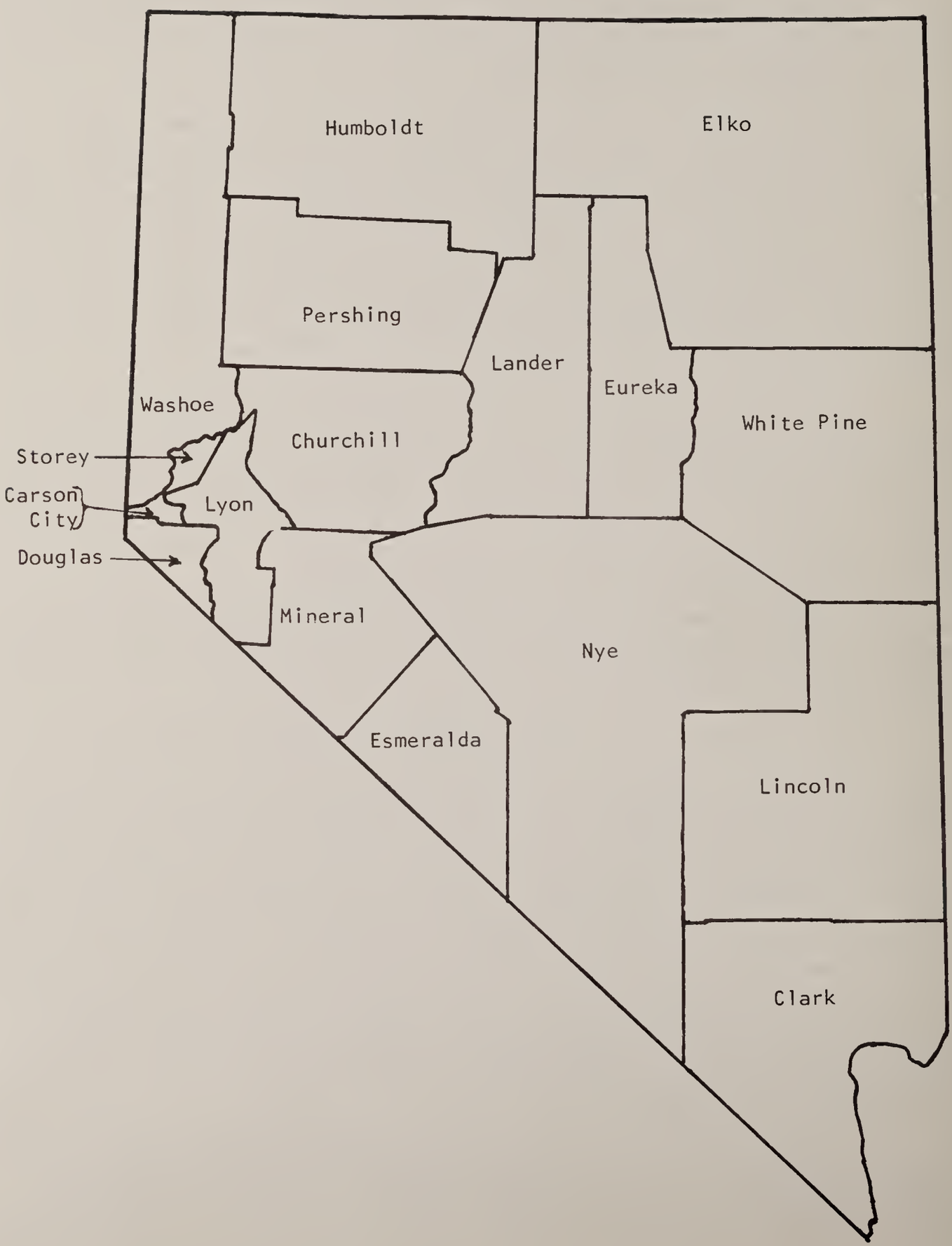
Along this same line we are indebted to W.G. D'Arcy of the Missouri Botanical Garden for permission to use the drawing of *Oryctes nevadensis* which was prepared by Yevonn L. Wilson. We are grateful to Stanley Welsh and Kaye Thorne for permission to use her drawing of *Sclerocactus pubispinus* from the *Illustrated Manual of Proposed Endangered and Threatened Plants of Utah*. One of our illustrations is over 100 years old, the drawing of *Astragalus pterocarpus* taken from Watson, "Botany." *In:* King (1871).

We are both very grateful to Loring Williams who acted as liason for everything from running messages back and forth between the authors, to mounting and mailing specimens, visiting the printer, and helping to host visiting botanists. His efforts helped considerably to allow this work to be completed on schedule.

Finally, there is a long list of people who contributed generously in various ways to the preparation of this work. We feel that at the very least we should list their names as a sign of our gratitude. We hope that we have remembered everyone, if we did not, then our apologies are humbly proffered. The length of the following list indicates the degree to which this manual is really the consequence of the efforts of a very large number of devoted workers: Tom Ackerman, Duane Atwood, Janice Beatley, Laurie Birdsey, C. Rose Broome, Susan Cochrane, Lincoln Constance, Alva Day, Mark Dimmitt, Julie Elfving, Barbara Ertter, Kenneth Genz, Sherel Goodrich, B.F. Harrison, Ronald L. Hartman, Lawrence Heckard, Douglas Henderson, L.C. Higgins, James Holland, Mary Holliday, Arthur Holmgren, Patricia Holmgren, Noel Holmgren, L.E. Horton, Alice Howard, J.T. Howell, Pat Lott, Emily McPherson, Wesley Niles, Patricia Packard, W. Robert Powell, Reed Rollins, Leila Shultz, Kaye Thorne, Arnold Tiehm, Gordon H. True, Jr., Stanley Welsh, Lynnette Wise, Stephen L. Williams, and Michael Yoder-Williams.

Undoubtedly, despite our best efforts we may have made mistakes. We would appreciate our readers calling our attention to any they find, it may hurt our egos, but that is not as bad as continued ignorance! Also, we would be grateful for any new information which our readers will share with us.

COUNTIES OF NEVADA



PLANTS FULLY DISCUSSED AND ILLUSTRATED

The plants which are fully discussed and illustrated belong to the following families. The arrangement is alphabetical by family names. Within each family, generic names are also arranged alphabetically.

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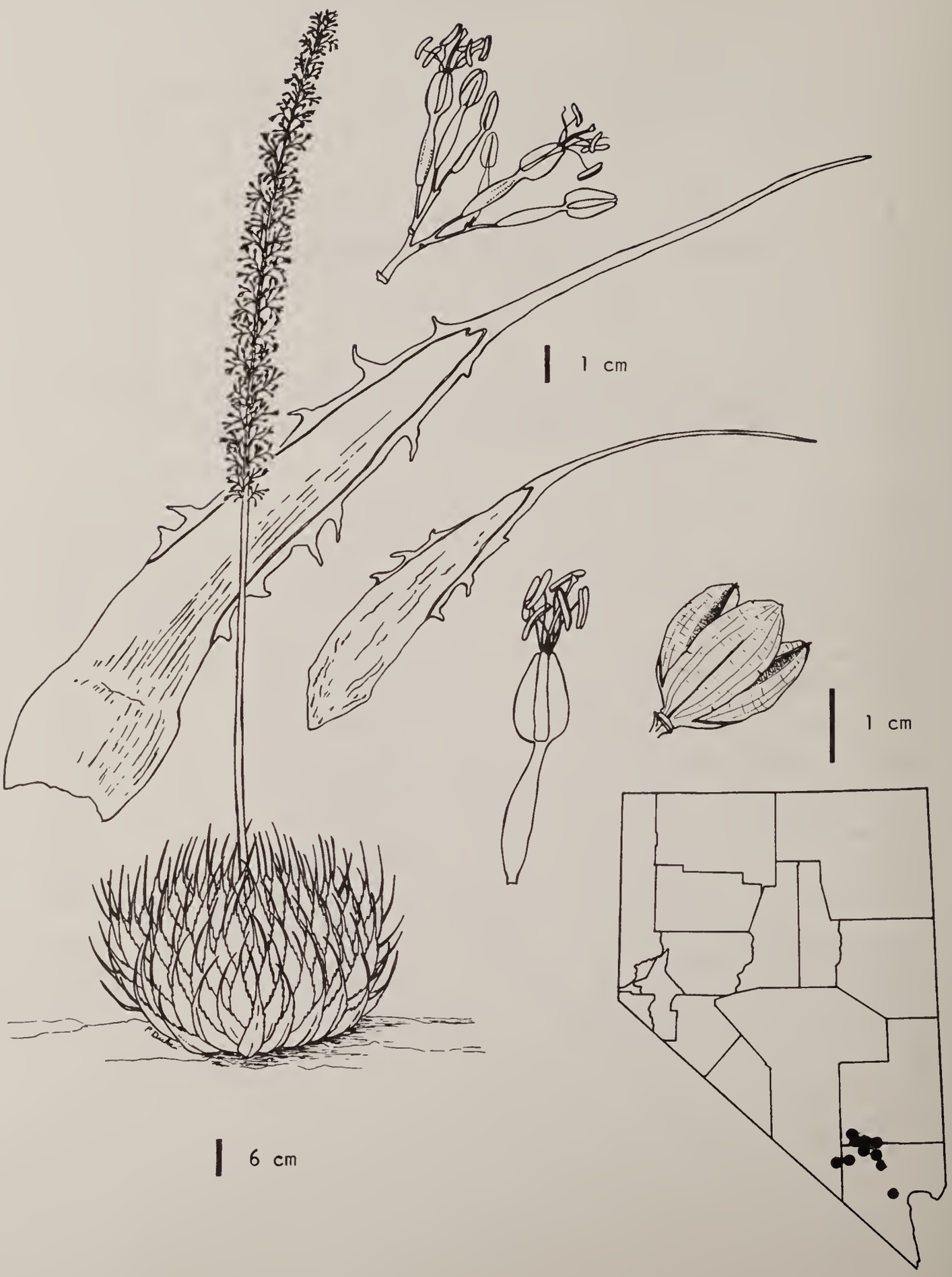
AGAVE UTAHENSIS var. EBORISPINA



AGAVE UTAHENSIS Engelm. var. EBORISPINA (Hester) Breitung
Ivory Spined Utah Agave

FAMILY: Agavaceae -- Agave Family

CITATION AND HISTORY: *Agave utahensis* var. *eborispina* (Hester) Breitung, Cactus and Succulent Journal (U.S.), 32:22. 1960. Synonym: *A. eborispina* Hester, Cactus and Succulent Journal (U.S.), 15:131. 1943. Type: Hester, Sheep Range, Clark County, NV, 22 July 1942. The long ivory spines on the leaves give this species its common name and its varietal name.

DESCRIPTION: Stemless plants, usually clustered with rosettes of fleshy, semi-rigid glaucous leaves 1.5 to 6 dm (6 to 24 in) long and 2 to 3.5 cm (0.8 to 1.4 in) wide. The margins have 3 to 5 barbs on each side and the terminal spine is 10 to 20 cm (4 to 8 in) long and typically curved inward.

Inflorescence stalks are characteristically 2.5 to 3.5 m (8 to 11.5 ft) tall and 5 to 7 cm (2 to 3 in) wide at the base. The numerous flowers are yellow, with six perianth segments from 1 to 1.3 cm long.

The mature fruit is 3 loculed and 1 to 1.4 cm in diameter and 2 to 3 cm (0.8 to 1.2 in) long and produces many thin, flat, black, and shining seeds approximately 2 to 4 mm long.

This variety of *Agave* is distinguished from related varieties by the very long terminal spines on the leaves, but, in reality, this feature is quite variable.

Flowering in May and June.

HABITAT: Exposed outcrops or ridges of limestone mountain ranges; occasionally on quartzite. Associated plants: sagebrush-pinyon-juniper; *Atriplex confertifolia, Coleogyne ramosissima, Gutierrezia microcephala,* and *Perityle megalocephala* var. *intricata.* Elevation: 1160-2590 m (3800-8500 ft).

KNOWN DISTRIBUTION: Clark, Lincoln, and Nye counties, Nevada. Inyo County, California.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, DOE (Nevada Test Site), State of Nevada, and USFWS.

EXISTING OR POTENTIAL THREATS: Private and commercial collectors. Bighorn sheep eat the flowering stalks. Insect predation. Proposed MX system.

REMARKS: This *Agave* is not common at any one place, but it is widely distributed so its existence is not believed to be threatened at this time. However, this status may change if the MX becomes a reality. Known populations should be monitored.

ANGELICA SCABRIDA

ANGELICA SCABRIDA Clokey & Mathias
Charleston Angelica

FAMILY: Apiaceae (Umbelliferae) -- Carrot Family

CITATION AND HISTORY: *Angelica scabrida* Clokey & Mathias, Southern California Academy of Sciences Bulletin, 37:8. 1938. Type: I.W. and C.B. Clokey, Charleston (Spring) mountains, Clark County, Nevada, 2200-2400 m, 4 August 1935. The specific name, *scabrida*, refers to the fact that various of the plant parts are scabrous or rough to the touch.

DESCRIPTION: A tall, alternate-leaved perennial up to 15 dm (60 in) tall. The pubescent stems bear large basal leaves that are pinnate with 9 leaflets arranged in groups of 3. Individual leaflets are lanceolate to ovate-lanceolate and 8 to 16 cm (3 to 6 in) long, and are never pubescent. Each of the teeth around the edge of the leaflets bears a small spine at the tip. Occasionally the leaves bear only obscure teeth. The petiole of each leaf is expanded into a sheath at the base which encloses the stem.

Flowers are borne in an umbel with 25 to 32 major stalks of unequal length from 1 to 7.5 cm (0.4 to 3 in) long. Each of these stalks in turn supports an umbellet with about 40 flowers on individual stalks 2 to 12 mm long. A single sheath-like bract sometimes occurs below the juncture of the major stalks in the umbel and the umbellets are occasionally subtended by a linear bract. Individual pedicels and the major stalks are rough to the touch.

The white flowers are succeeded by indistinctly ribbed, flattened fruits which are either rough or smooth at maturity and 8 to 14 mm long with narrow wings.

Angelica breweri Gray is similar but has petals which are pubescent on the outside and densely pubescent ovaries whereas those of *A. scabrida* are at most roughened.

Flowering in July and August.

HABITAT: In gravelly washes and on hillsides. Associated plants: *Pinus ponderosa* var. *scopulorum*, *Cercocarpus ledifolius*, and *Populus tremuloides*. Elevation: 1315-2560 m (4320-8400 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, State of Nevada, USFS, and private.

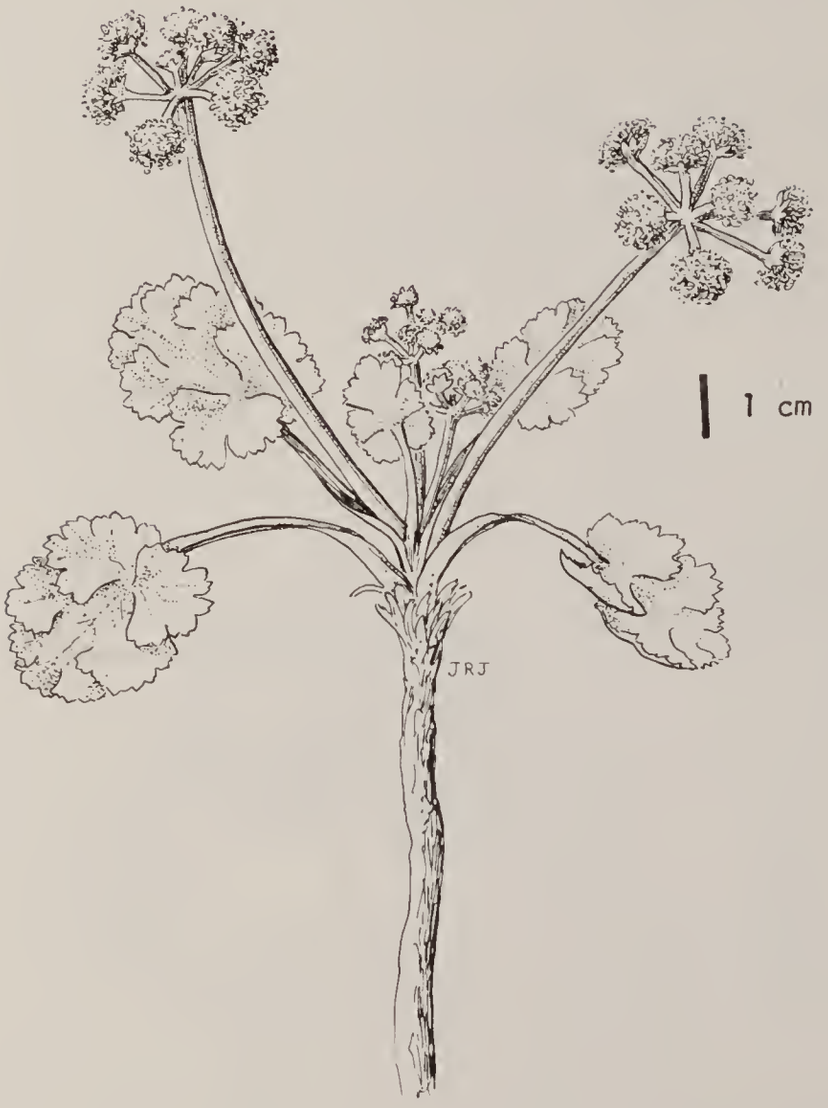
EXISTING OR POTENTIAL THREATS: Disturbance of the habitat by users of the recreation area where *Angelica scabrida* is found. Proposed MX system (indirectly).

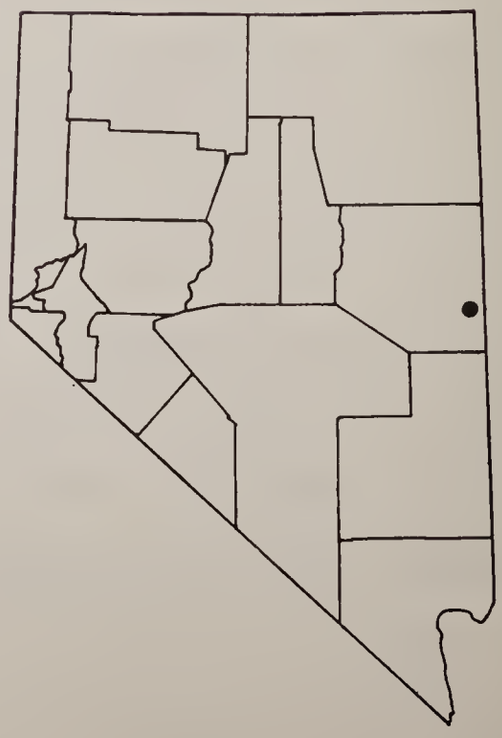
REMARKS: The expanding population in the Las Vegas area will increase the impact on the plants in the Spring Mountains.

CYMOPTERUS BASALTICUS

5 mm

2 mm





CYMOPTERUS BASALTICUS M.E. Jones
Basalt Spring Parsley

FAMILY: Apiaceae (Umbelliferae) -- Carrot Family

CITATION AND HISTORY: *Cymopterus basalticus* M.E. Jones, Contributions to Western Botany, 12:16. 1908. Synonyms: *Coriophyllus basalticus* (Jones) Rydb., Flora of the Rocky Mountains, 620. 1917. *Aulospermum basalticum* (Jones) Tidestrom, Contributions from the National Herbarium, 25:397. 1925. Type: Jones, Beaver County, Utah, 7000 ft, 15 May 1906. The specific name, *basalticus*, was chosen because this species was found growing in crevices of nearly bare basaltic rocks.

DESCRIPTION: A perennial producing little or no stem from a thick tap root. The leaves are 5 to 7 cm (2 to 2.8 in) long and three to five lobed, and somewhat kidney shaped or oblong in outline.

The flowering stem is 6 to 12 cm (2.4 to 4.8 in) high, glabrous, and has a bluish waxy bloom throughout. The umbel has several rays and an involucre which is absent or composed of one or two linear bracts. The clusters of yellow or purplish flowers are subtended by several conspicuous linear to obovate bracts about the same length or longer than the flowers.

The ovate fruit is 3 to 5 mm long and has well developed wings.

The common *Cymopterus purpurascens* (Gray) M.E. Jones can easily be separated from this species by the former's conspicuous involucre of white bracts. *C. acaulis* (Pursh) Raf. has more finely dissected leaves and white flowers.

Flowering in May.

HABITAT: Bare basaltic rocks; sterile clay hills. Associated plants: pinyon-juniper, *Artemisia tridentata, A. spinescens, Hermidium alipes,* and *Penstemon dolius*. Elevation: 1770-2135 m (5800-7000 ft).

KNOWN DISTRIBUTION: White Pine County, Nevada. Utah.

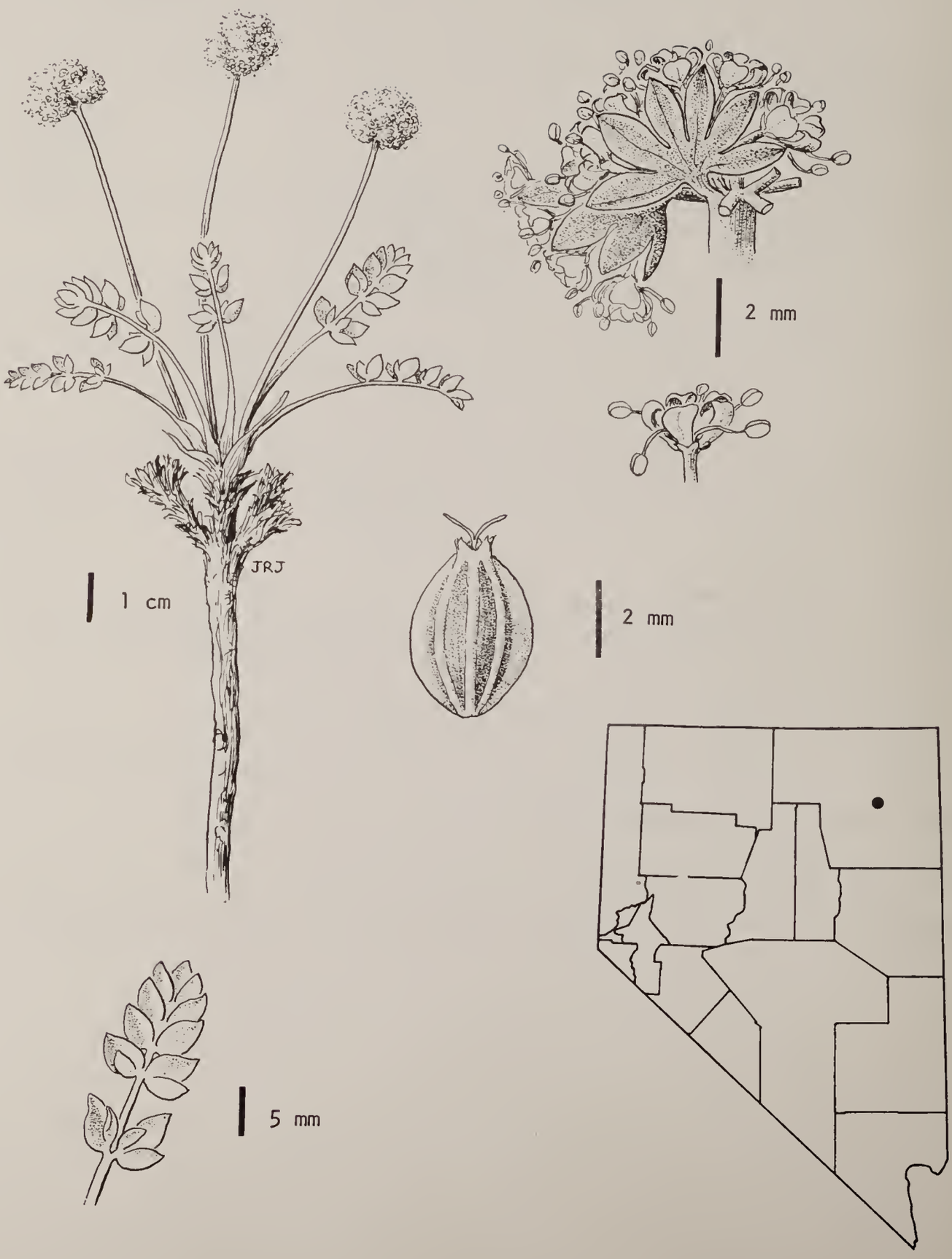
STATUS: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: As far as is known, this taxon has only been collected once in Nevada.

CYMOPTERUS NIVALIS



CYMOPTERUS NIVALIS S. Wats.
Snowy Spring Parsley

FAMILY: Apiaceae (Umbelliferae) -- Carrot Family

CITATION AND HISTORY: *Cymopterus nivalis* S. Watson, "Botany," p. 123. *In:* C. King, Report of the geological explorations of the Fortieth Parallel. Vol. 5. 1871. Type: Watson, East Humboldt Mountains, Elko County, Nevada, 9000 ft, July 1868. The specific name, *nivalis,* means snowy and refers possibly to the snow covered mountains where this species was found or to the white flowers of the plants.

DESCRIPTION: A stemless perennial developing from a long, slender taproot with once or twice pinnate leaves 1.5 to 5 cm (0.6 to 2 in), pubescent with small hairs, and with the small leaf segments linear to ovate and 1 to 10 mm long.

The inflorescence stalks exceed the leaves and are 4 to 10 cm (1.6 to 4 in) long supporting a condensed flowered umbel. There are no bracts at the base of the main umbel and the main rays are less than 5 mm long. The flowers are white or sometimes pinkish.

The fruit produces a thin wing on either side.

The compact, condensed flowering umbel, white flowers, and small size readily distinguishes this from other members of the Carrot Family found in the same area. *C. nivalis* can be separated from the related *C. bipinnatus* S. Wats. by the latter's larger size, leaves tending to be three times pinnate, and the main rays of the umbel frequently longer than 5 mm. *C. humboldtensis* Jones, which grows in the same general area, is a larger, glabrous plant. Although the original description of *C. nivalis* refers to white flowers, Idaho plants have recently been characterized as having yellow flowers. The drawing was prepared from Idaho plants.

Flowering in July.

HABITAT: Dry, rocky sites in subalpine and alpine zones; possibly on limestone. Associated plants: not known. Elevation: 2745-3520 m (9,000-11,550 ft).

KNOWN DISTRIBUTION: Elko County, Nevada. Idaho and Montana.

STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); threatened (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: None known.

REMARKS: *Cymopterus nivalis* is only known in Nevada from the type collection by Watson. It was incorrectly reported from a collection made in the Toquima Range in Nye County. It has been searched for superficially, but unsuccessfully, in the East Humboldt Range and in the Ruby Mountains.

ASCLEPIAS EASTWOODIANA

ASCLEPIAS EASTWOODIANA Barneby
Eastwood Milkweed

FAMILY: Asclepiadaceae -- Milkweed Family

CITATION AND HISTORY: *Asclepias eastwoodiana* Barneby, Leaflets of Western Botany, 4:210. 1945. Type: Ripley and Barneby, Reese River Valley, Lander County, Nevada, 5800 ft, 11 June 1944. This species was named in honor of Miss Alice Eastwood.

DESCRIPTION: A low and few stemmed perennial from a woody caudex. The sparsely pubescent leaves are white-ciliate margined. The characteristic flexuous stems are 1 to 2 dm (4 to 8 in) long and sparsely pubescent. The basal leaves are broadly ovate to nearly circular and 1 to 3 cm (0.4 to 1.2 in) long. The stem leaves are 2.5 to 4.5 cm (1 to 1.8 in) long and ovate-acuminate while the upper-most leaves are lanceolate-acuminate and nearly sessile.

The lateral or occasional terminal umbels bear 6 to 11 flowers. Individual pedicels are filiform, erect, and 1.5 to 2 cm (0.6 to 0.8 in) long and somewhat purplish. Calyx teeth are narrow and ovate-acute, ciliate pubescent, and 2 to 3 mm long. The petals are purplish-violet with thin membranous margins.

The fruits are spindle shaped, pendulous, and about 7 cm long. They are glabrous to very lightly pubescent. (This description and the drawing were taken from an immature fruit.)

The species differs from the closely related *Asclepias involucrata* Engelm. by its purple flowers and broad basal leaves. From *A. ruthiae* Maguire it may be distinguished by the former's characteristically terminal inflorescence and dense pubescence.

Flowering in late May and June.

HABITAT: Low alkaline clay hills, or shallow, gravelly drainages, usually growing apart from other plants: Associated plants: *Atriplex confertifolia, Sarcobatus vermiculatus, Tetradymia glabrata, Artemisia spinescens,* and *Kochia americana.* Elevation: 1615-2105 m (5300-6900 ft).

KNOWN DISTRIBUTION: Esmeralda, Lander, and Nye counties, Nevada.

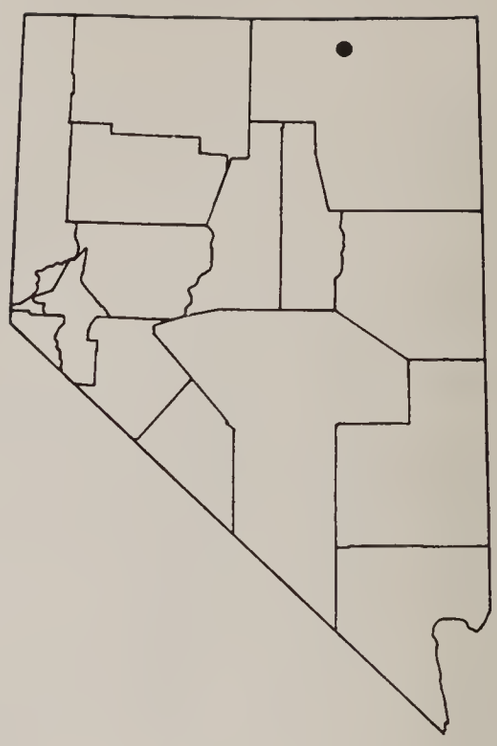
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 25 Feb 1978); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, DOD (Nellis AFB Bombing and Gunnery Range), DOE (Tonopah Test Range), and USFS.

EXISTING OR POTENTIAL THREATS: Predation by animals or insects. Habitat destruction by construction. Proposed MX system.

REMARKS: Although this milkweed is now known from many locations, it is not abundant at any one site and it does not appear to be reproducing well. Few flowers develop seed pods.

ANTENNARIA ARCUATA



♂

1 mm

♀

1 mm

ANTENNARIA ARCUATA Cronquist
Arching Pussytoes

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Antennaria arcuata* Cronquist, Leaflets of Western Botany, 6:41. 1950. Type: Christ, Blaine Co., ID. 1946. The stolons are curved like a bow, hence the common name and the specific name, *arcuata*.

DESCRIPTION: A loosely white-woolly perennial with conspicuous arching stolons each of which roots late in the season and produces a short-lived plant with a single erect flowering stem 3 to 4 dm (12 to 16 in) tall. The few basal leaves are oblanceolate and not persistent and average several cm long. The numerous stem leaves are narrow and gradually reduced upward.

The flowering heads are moderately numerous and aggregated in a terminal cluster. The involucre is about 5 mm high and tomentose below. Individual bracts are whitish and minutely lined at the apices. The flower heads of male plants are about 5 mm high by 3 to 3.5 mm wide, while those of the female plants are taller and narrower (5 to 7 mm high by 2.5 mm wide). The involucral bracts of the male heads are obovate, rounded at the apex, and average 4 mm long by 1.4 mm wide. Those of the female plants are narrowly obovate, acute, and about 6 mm long by 1 mm wide. The corolla of the male flowers is proportionately wider and shorter than that of the female. The pappus hairs are flexuous and somewhat clavate at the tip in the male, while the female has relatively straight and finer capillary hairs.

Taxonomically, this species is quite distinct from any other *Antennaria*. The arching stolons are very short early in the season, but lengthen up to 10 cm (4 in), these are the most distinctive and unique character of the species.

Flowering in July and August.

HABITAT: At the edge of wild hay meadows in areas that are not permanently wet. Associated plants: *Potentilla gracilis*, *Deschampsia caespitosa*, *Antennaria rosea*, *Sisyrinchium douglasii*, *Achillea millefolium*, and *Juncus* sp. *Antennaria stenophylla* grew nearby in drier soil. Elevation: 1600-1950 m (5250-6400 ft).

KNOWN DISTRIBUTION: Elko County, Nevada. Idaho, Oregon, and Wyoming.

STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979); threatened (Mozingo and Williams).

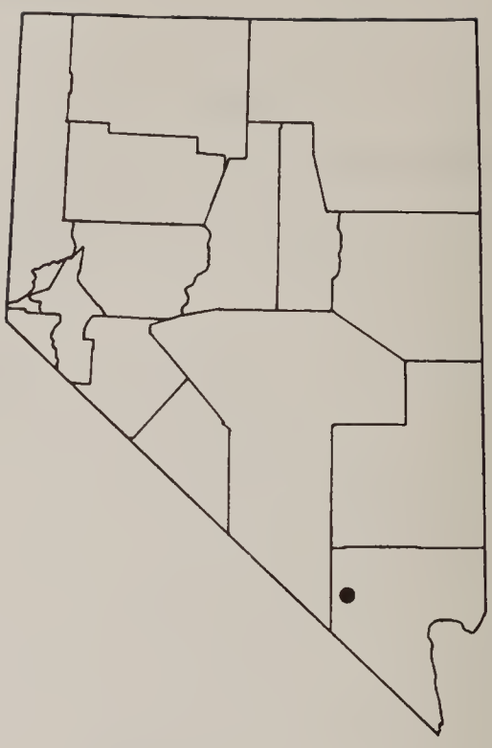
LAND OWNERSHIP/MANAGEMENT: Private and possibly USFS.

EXISTING OR POTENTIAL THREATS: Plowing and reseeding of the meadows.

REMARKS: *Antennaria arcuata* has survived for many years in meadows in Nevada in spite of cattle grazing and the mowing of the meadows for wild hay. However, this species has been rarely collected and is unique in its genus and for those reasons should be protected.

ANTENNARIA SOLICEPS

3 mm



1 cm

ANTENNARIA SOLICEPS Blake
Charleston Pussytoes

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Antennaria soliceps* Blake, Proceedings of the Biological Society of Washington, 51:7. 1938. Type: Clokey and Bean, Charleston (Spring) Mountains, Clark Co., NV, 3350 m, 8 July 1937. The specific name, *soliceps*, refers to the solitary heads of these plants.

DESCRIPTION: A tufted perennial forming mats to 45 cm (18 in) wide with short, prostrate stolons. The basal leaves are spatulate-obovate and 6 to 9 mm long and densely white-pubescent. The young leaves on the stolons and sometimes at the base of the stem are much less pubescent. The stem leaves are 5 to 8 mm long and only 1 to 2 mm wide.

The mature flowering heads are 8 to 10 mm high and bear about 60 flowers surrounded by involucral bracts, the outermost of which have a conspicuous blackish-brown spot. The pappus on the 1.5 mm achenes is white and about 6 mm long.

The main distinguishing feature which separates this species from most other antennarias is the large and solitary head on each flowering stalk. The common *A. dimorpha* (Nutt.) T.&G. which also has solitary heads can be separated by its lack of stolons, much larger leaves, and involucral bracts which are dingy-brown but lack the conspicuous blackish-brown spot of *A. soliceps*.

Flowering in July and August.

HABITAT: Timbered mountain meadows, open scree slopes, and north facing cliffs. Associated plants: *Pinus longaeva, Draba jaegeri, Sphaeromeria compacta,* and *Ivesia cryptocaulis*. Elevation: 2670-3520 m (8760-11,550 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

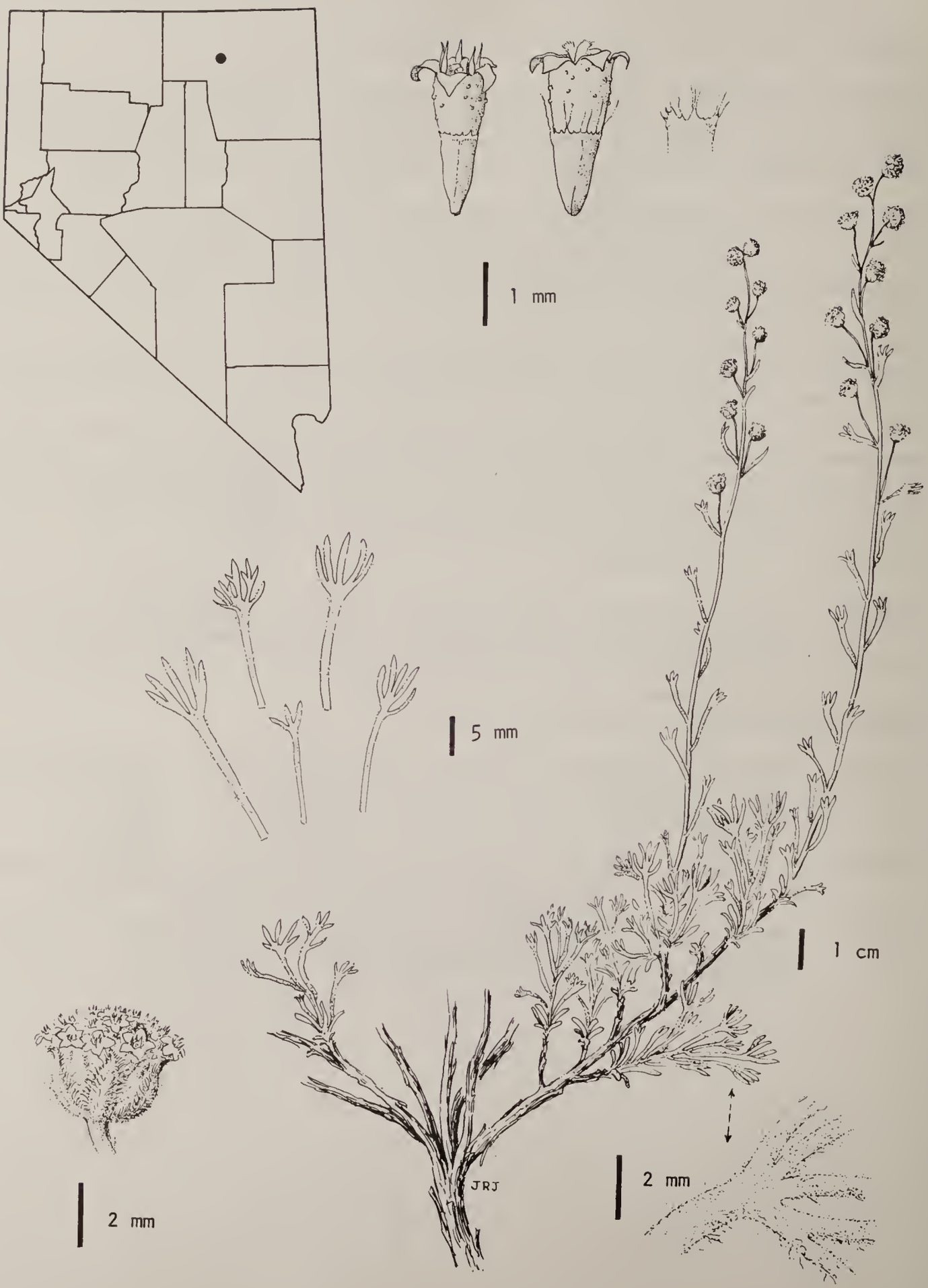
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: USFS and possibly private.

EXISTING OR POTENTIAL THREATS: Free roaming horses and foot-traffic on unstable slopes. Proposed MX system (indirectly).

REMARKS: The expanding population in southern Nevada will increase the impact on plants in the Spring Mountains.

ARTEMISIA PAPPOSA



ARTEMISIA PAPPOSA Blake & Cronquist
Fuzzy Sandwort

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Artemisia papposa* Blake & Cronquist, Leaflets of Western Botany, 6:43. 1950. Type: Maguire and Holmgren, Owyhee County, Idaho, 7 June 1946. The seeds of this species have a minute pappus (fuzz), hence the common name and the specific name, *papposa*.

DESCRIPTION: A low shrubby plant with short, leafy branches and flowering stems to 20 cm (8 in) tall. The leaves are 1 to 3 cm (0.4 to 1.2 in) long, three or more lobed at the apex and pubescent with spreading or appressed, somewhat tangled short hairs. Some stem leaves are occasionally unlobed.

The inflorescence bears 4 to 10 heads. The achenes have a crown consisting of a short irregularly toothed membrane with some of the teeth drawn out into hairs.

The short habit and irregularly multilobed leaves easily separate this species vegetatively from any other artemisias found in the area. Additionally, the presence of a minute, but definite pappus membrane on the achene separates this from any other known species of *Artemisia*.

Flowering in May and June.

HABITAT: Open places; sometimes on alkaline flats; or on thin, stony, mineral soil at the edge of mountain meadows; moist early in the season, drying later. Associated plants: *Haplopappus lanceolatus, Navarretia propinqua, Orthocarpus hispidus,* and *Madia exigua,* surrounded by *Artemisia* sp. Elevation: 1130-2010 m (3700-6600 ft).

KNOWN DISTRIBUTION: Elko County, Nevada. Idaho and Oregon.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: USFS and private.

EXISTING OR POTENTIAL THREATS: Cattle grazing. Range improvements such as reseeding.

REMARKS: An effort should be made to determine the full range of *Artemisia papposa*.

BRICKELLIA KNAPPIANA

BRICKELLIA KNAPPIANA E. Drew
Knapp Brickellia

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Brickellia knappiana* E. Drew, Pittonia, 1:260. 1888. Synonym: *Coleosanthus knappianus* Greene, Erythrea, 1:54. 1893. Type: Knapp, San Bernardino Co., CA, 1888. This species is named for M.A. Knapp who collected the type specimen.

DESCRIPTION: A slender shrub with willow-like branches which reaches a height of 1 to 2 m (40 to 80 in). The bark is smooth, white, and tends to become shredded on older stems. The lanceolate or narrow-ovate leaves are 2.5 to 3.5 cm (1 to 1.4 in) long, on petioles which are 4 to 5 mm long. The leaves grade from sharply toothed to nearly entire, particularly in the upper parts of the plant.

The flowering heads have only three to seven flowers which are white to light pink. The involucral bracts number about 20 and are minutely pubescent.

The willow-like aspect of this shrub is an immediate distinguishing characteristic, as are the relatively few flowers in the head. Other brickellias generally have 8 to 26 flowers in each head. From *Brickellia multiflora* Kell. it can be separated by its pubescent rather than glabrous aspect and by the consistently entire leaves of *B. multiflora*.

Flowering in the autumn.

HABITAT: Rocky slopes; canyon walls. Associated plants: Sonoran zone; *Atriplex confertifolia*. Elevation: 760-1340 m (2500-4400 ft).

KNOWN DISTRIBUTION: Clark Co., NV. Inyo and San Bernardino cos., CA.

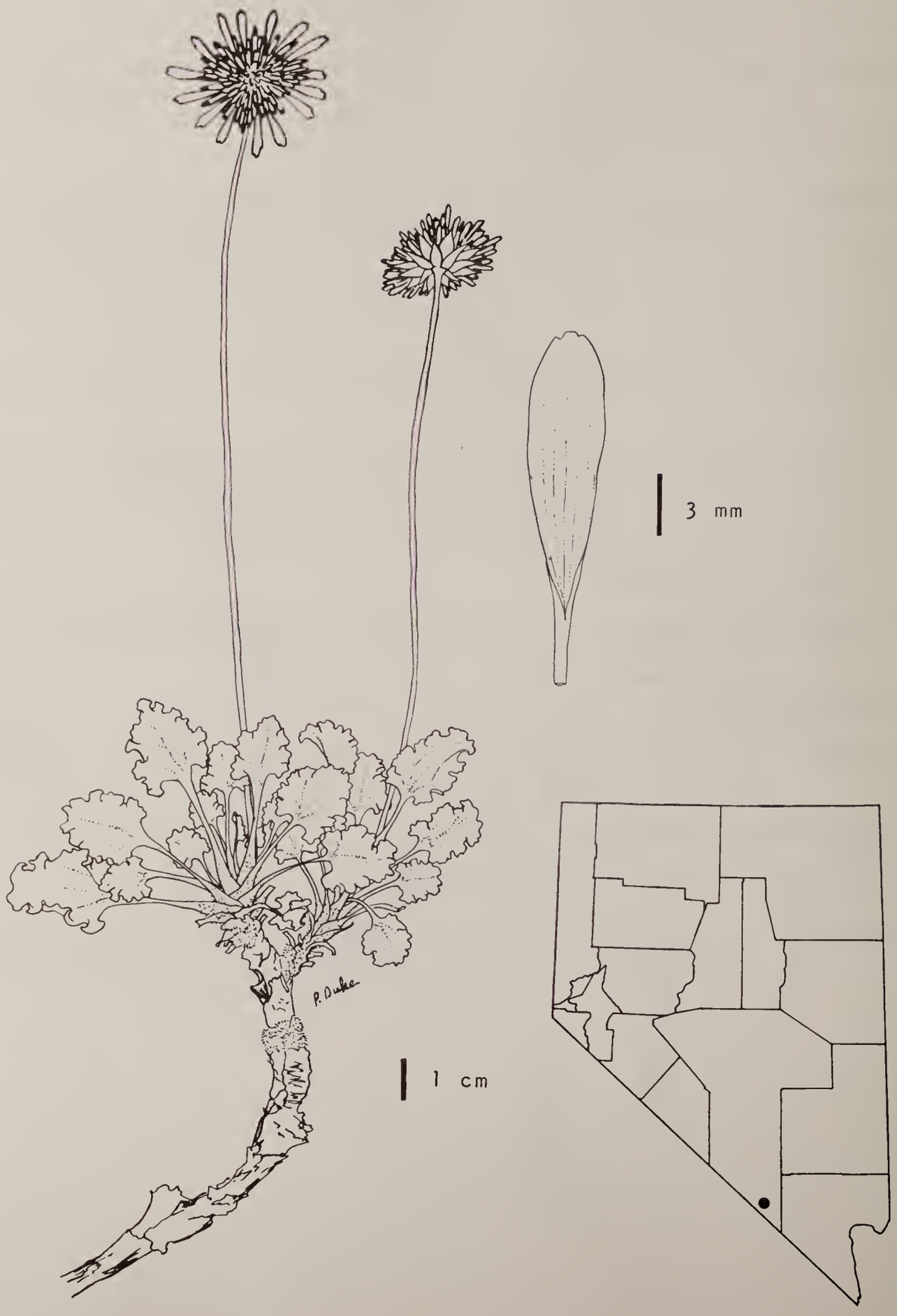
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: BLM and USFWS.

EXISTING OR POTENTIAL THREATS: None known.

REMARKS: A concerted effort should be made to determine the full range, distribution, and threats, if any, to this rare taxon which is only known from two collections in Nevada. It is more common in California.

ENCELIOPSIS NUDICAULIS var. CORRUGATA



ENCELIOPSIS NUDICAULIS (Gray) A. Nels. var. CORRUGATA Cronq.
Ash Meadows Sunray

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Enceliopsis nudicaulis* var. *corrugata* Cronq., Bulletin of the Torrey Botanical Club, 99:246. 1972. Type: Cronquist, Ash Meadows, Nye County, Nevada, 730 m, 20 April 1966. Earlier collections had been made by Beatley, Reveal, and others. The varietal name, *corrugata*, refers to its strongly ruffled-corrugate leaves.

DESCRIPTION: A perennial, forming clumps 1 to 4 dm (4 to 16 in) high from a stout woody root-stock. The leaves are densely tomentose with fine, grayish-white hairs and are relatively small, with a blade 1 to 2 cm (0.4 to 0.8 in) long, and ovate to subcircular in shape.

The leafless flower stalks bear individual heads with disks 2 to 3.5 cm (0.8 to 1.4 in) across. The ray flowers number 11 to 23 and possess yellow corollas 2 to 2.5 cm (0.8 to 1 in) long. The disk flowers are strongly compressed.

The silky-pubescent achenes bear 2 short awl-shaped awns connected by a whorl of short, fused scales; although sometimes no pappus is present on the achenes.

This variety can be separated from the typical form of the species by the smaller leaves which, in the field, are strongly ruffled-corrugate as contrasted with the flat leaves of the widespread typical form. The other species of *Enceliopsis*, *E. argophylla* (D.C. Eat.) A. Nels., to be found in this same general area possesses rhombic-ovate leaves with blades 4 to 10 cm (1.6 to 4 in) long with a silvery pubescence.

Flowering in April and May.

HABITAT: Dry washes, or outcrops of pale, hard limestone, which weathers to a whitish saline soil. Associated plants: *Atriplex confertifolia*, *Haplopappus acradenius*, *Arctomecon merriamii*, and *Cryptantha confertiflora*. Elevation: 700-735 m (2300-2410 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

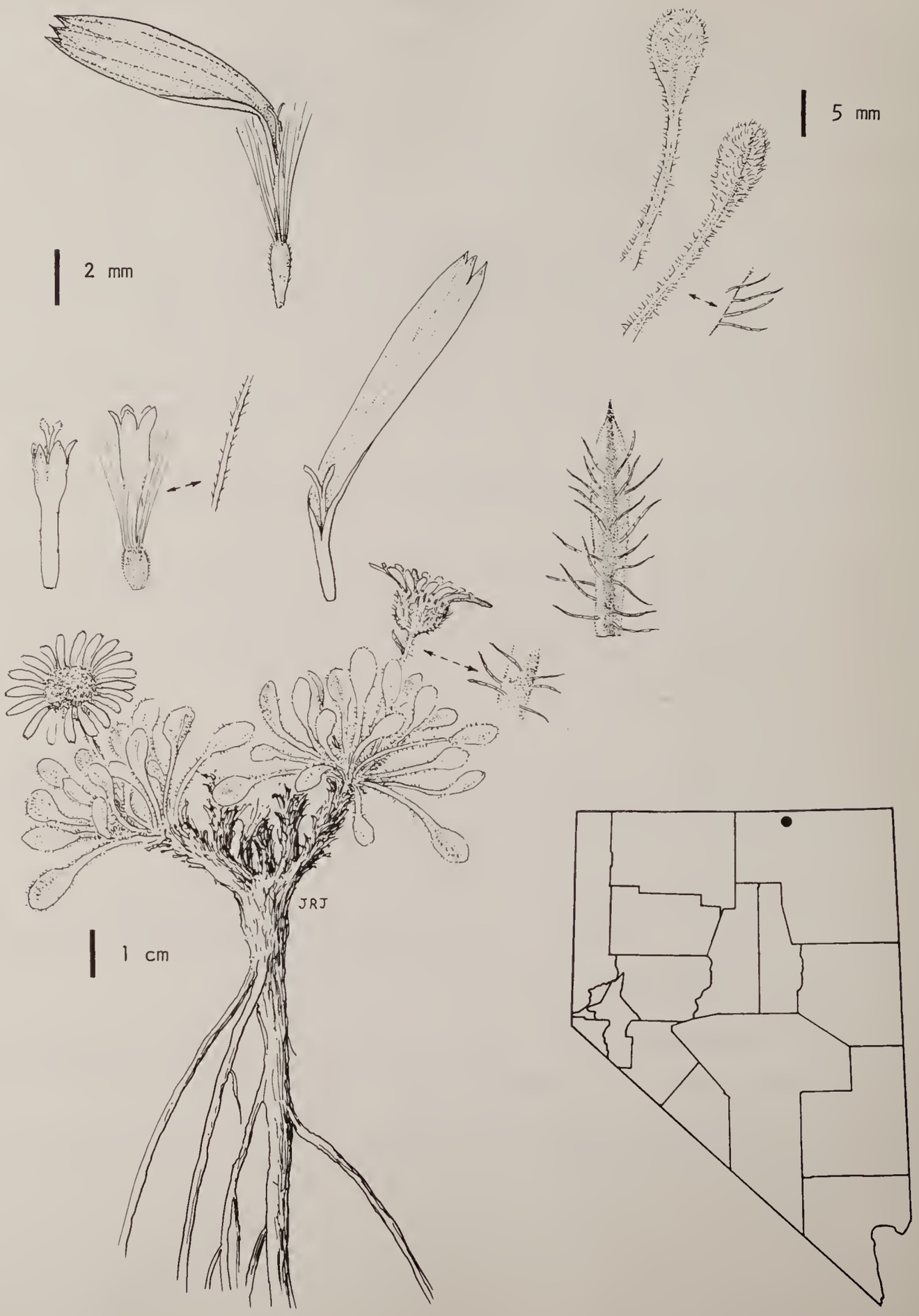
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Utilization of land for agricultural or other developmental purposes. Destruction by free roaming horses. Proposed MX system (indirectly).

REMARKS: *Enceliopsis nudicaulis* var. *corrugata* appears to be limited to a particular edaphic condition so that any loss of habitat would be critical.

ERIGERON LATUS



ERIGERON LATUS (Nels. & Macbr.) Cronq.
Broad Fleabane

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Erigeron latus* (Nels. & Macbr.) Cronquist, Brittonia, 6:192. 1947. Synonym: *Erigeron poliospermus* var. *latus* Nels. & Macbr. Botanical Gazette, 55:383. 1913. Type: Nelson and Macbride, Owyhee Co., Idaho, 1 July 1912. The specific name, *latus*, means broad and possibly refers to the broad flowering heads.

DESCRIPTION: A finely glandular and sparsely pubescent herb 3 to 8 cm (1.2 to 3.2 in) high which is perennial by means of a stout root-stock. The leaves are coarsely hairy and glandular with the basal leaves oblanceolate to spatulate and up to 6 cm (2.4 in) long. The stem leaves are much smaller and linear, or may be absent.

The flowering heads are borne singly and are 10 to 20 mm broad. The involucral bracts are densely glandular, coarsely hairy, and have a brown midrib and purplish tip. The ray flowers are purple and number about 15 to 25. The disk corollas are 4.7 to 6 mm long.

The achenes have a tuft of 20 to 27 coarse and firm bristles at their tips and are themselves somewhat pubescent or nearly hairless when mature.

The most distinctive features of this species are the large purple-rayed heads, nearly leafless stems and relatively large basal leaves and the glandular nature associated with a rather coarse spreading pubescence. *Erigeron argentatus* A. Gray, while similar in form, is readily distinguished by its silvery pubescence, achenes with 6 to 8 nerves rather than 2 to 3 as is the case with *E. latus*.

Flowering in July.

HABITAT: Gravelly or rocky hillsides; volcanic sands. Associated plants: *Haplopappus acaulis*, *Eriogonum strictum* ssp. *proliferum*, *E. heracleoides*, *E. microthecum* var. *laxiflorum*, and *Phoenicaulis cheiranthodes*. Elevation: 1950 m (6400 ft).

KNOWN DISTRIBUTION: Elko County, Nevada. Idaho.

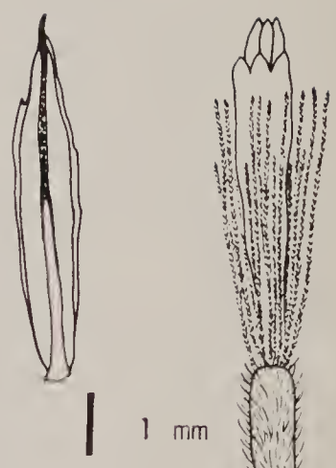
STATUS: Endangered (1975 and 1976 *FR*): threatened (Reno T/E Workshop, 2 Nov 1979).

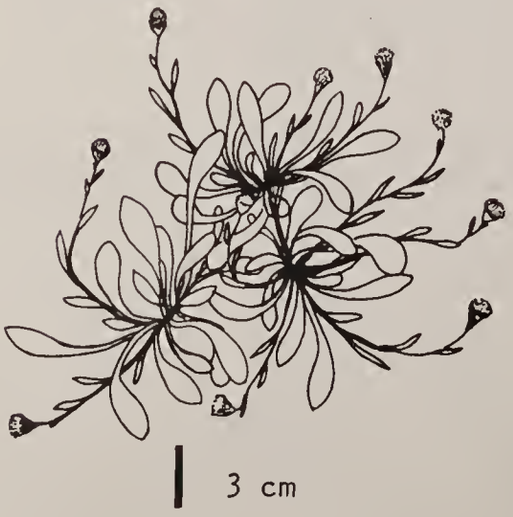
LAND OWNERSHIP/MANAGEMENT: USFS and possibly private.

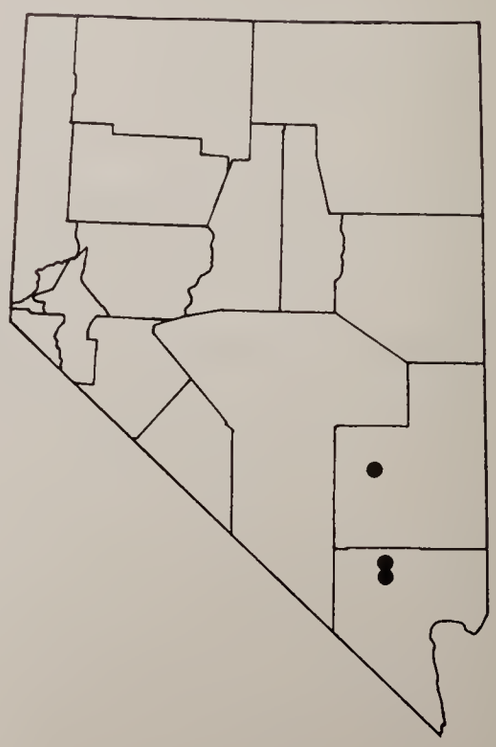
EXISTING OR POTENTIAL THREATS: None known.

REMARKS: Not enough is known about this rare species to determine the threats to it. An intensive search should be conducted to determine its distribution and abundance.

ERIGERON OVINUS







ERIGERON OVINUS Cronq.
Sheep Fleabane

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Erigeron ovinus* Cronquist, Brittonia, 6:164. 1947. The original collection was formerly referred to *Erigeron caespitosus* ssp. *anactis* Blake. Type: Purpus, Mt. Irish, Lincoln County, NV. 1898. The specific name, *ovinus*, pertains to sheep.

DESCRIPTION: A perennial with a stout branching root-stock. The 5 to 15 cm (2 to 6 in) stems are prostrate with ascending tips or are essentially erect. The leaves and stems are densely pubescent with spreading hairs. The leaves, especially towards the base, are usually triple-nerved. The basal leaves are obovate or oblanceolate and reach a maximum size of 7 cm (2.8 in) long by 13 mm wide. The stem leaves are reduced and generally relatively narrower.

The flowering heads are solitary, with a disk 7 to 14 mm wide. The involucre is shorter than the disk and 6 to 8 mm high. The involucral bracts are densely glandular and sometimes sparsely tomentose with coarse, spreading hairs. The inner involucral bracts are often purplish at the tips. The rays or pistillate flowers are absent, while the disk corollas are 4 to nearly 6 mm long. The double pappus consists of 15 to 25 firm bristles in an inner circle with minute and sometimes obscure bristles in an outer whorl. The pappus is tawny or brownish in color and the achene is pubescent.

This species can be separated from the related *Erigeron caespitosus* Nutt. by the densely glandular involucre which is sometimes coarsely hairy, by the much longer hairs of the stems and leaves, and most obviously, by the lack of pistillate flowers.

Flowering in June.

HABITAT: Limestone rock outcrops, north side of cliffs, and at the base of cliffs. Associated plants: *Pinus monophylla*, *P. ponderosa*, *Abies concolor*, and *Cercocarpus intricatus*. Elevation: 1890-2560 m (6200-8400 ft).

KNOWN DISTRIBUTION: Clark and Lincoln counties, Nevada.

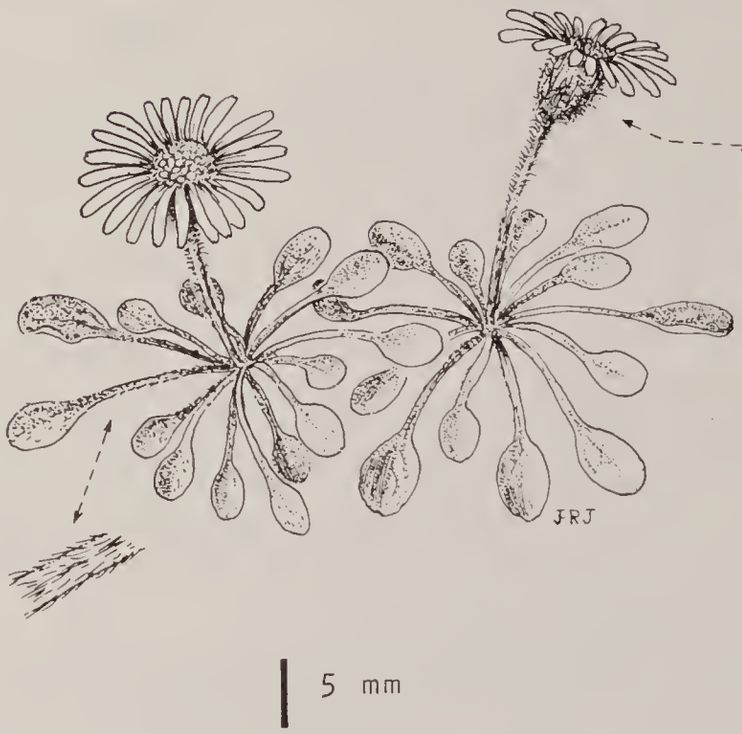
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

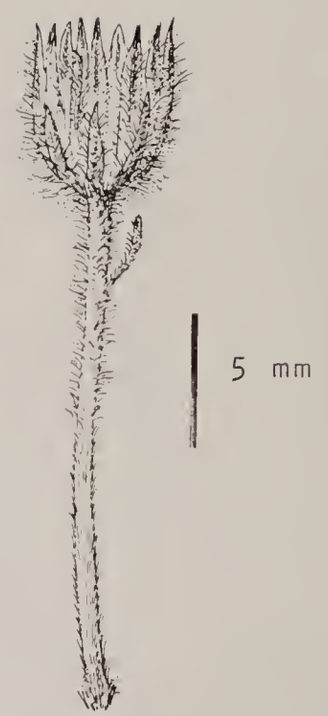
LAND OWNERSHIP/MANAGEMENT: USFWS.

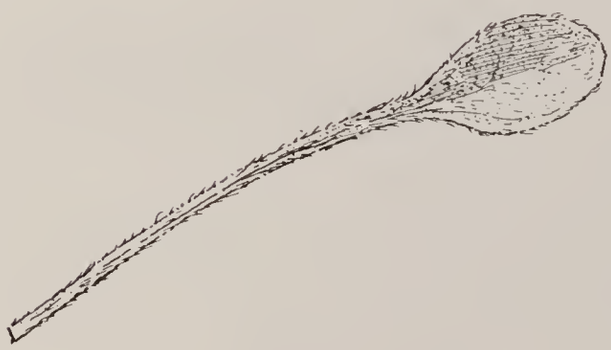
EXISTING OR POTENTIAL THREATS: If the present management policies continue in the Desert National Wildlife Range there will be no threats to this taxon there.

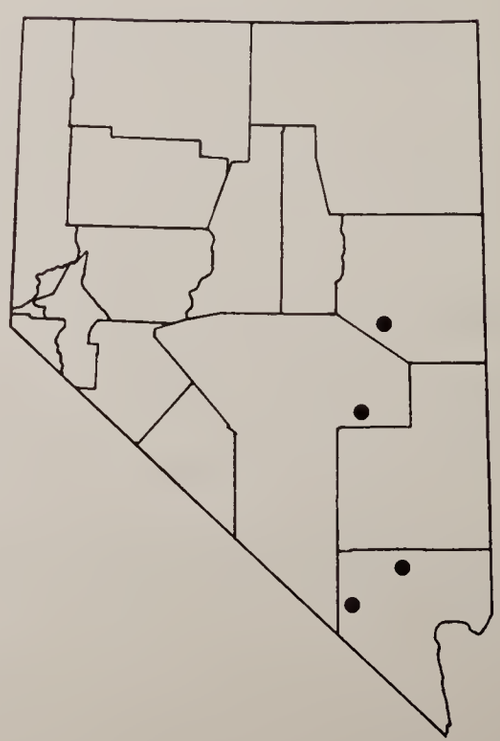
REMARKS: The known populations of *Erigeron ovinus* should be monitored and it should be searched for in similar habitats, particularly in Lincoln County.

ERIGERON UNCIALIS var. CONJUGANS









ERIGERON UNCIALIS Blake ssp. CONJUGANS (Blake) Cronq.
Inch High Fleabane

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Erigeron uncialis* ssp. *conjugans* (Blake) Cronquist, Brittonia, 6:211. 1947. Synonym: *E. uncialis* var. *conjugans* Blake, Proceedings of the Biological Society of Washington, 47: 174. 1934. Type: Hitchcock, Big Falls, Kyle Canyon, Charleston (Spring) Mountains, 9000 ft, 3 Sept. 1927. The specific name, *uncialis*, means inch high.

DESCRIPTION: A small perennial with leafless flowering stems 1 to 5 cm (0.4 to 2 in) tall. The leaves are all basal, i.e., borne on top of the branching root-stock. The pubescence on the petioles and the lower portion of the flowering stem is mostly appressed. The leaf blades are broadly elliptic to nearly circular. The leaves vary in size.

The flowering heads are borne singly and bear 15 to 40 white or light rose ray flowers. The involucral bracts are finely glandular, with long hairs and characteristically thin and green, or with a green midrib. Sometimes the bracts have reddish-purple margins. The ray flowers are 4 to 6 mm long, while the disk flowers have a corolla between 2.7 and 3.4 mm in length.

The short-hairy achenes possess a pappus of 13 to 22 firm bristles.

This variety can be separated from the typical form of the species by the appressed hairs on the petioles and lower part of the flowering stem. From the related *Erigeron tener* Gray it can be distinguished by its smaller habit and normally leafless flower stalks. In addition, *E. tener* lacks spreading hairs on the leaves or flowering stems.

Flowering in June and July.

HABITAT: Crevices in faces of limestone cliffs and outcrops. Associated plants: *Abies concolor*, *Pinus monophylla*, *P. ponderosa*, *Juniperus osteosperma*, *Leptodactylon* sp., or *Ivesia jaegeri*; mosses. Elevation: 2230-3395 m (7315-11,135 ft).

KNOWN DISTRIBUTION: Clark, Nye, and White Pine counties, Nevada.

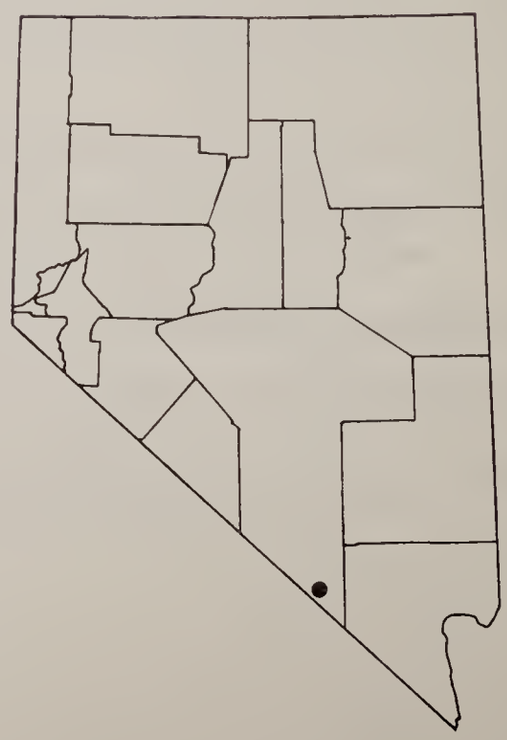
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFS and USFWS.

EXISTING OR POTENTIAL THREATS: Proposed MX system (indirectly).

REMARKS: This is a rare plant and could easily be overlooked. Known populations should be monitored.

GRINDELIA FRAXINO-PRATENSIS



GRINDELIA FRAXINO-PRATENSIS Reveal & Beatley
Ash Meadows Gumweed

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Grindelia fraxino-pratensis* Reveal and Beatley, Bulletin of the Torrey Botanical Club, 98:332. 1971. Type: Reveal and Holmgren, Ash Meadows, Nye County, Nevada, 660 m, 21 August 1968. Both the common name and the specific name were taken from *fraxinus*, meaning ash, and *pratensis*, meaning of the meadow.

DESCRIPTION: An erect biennial or perennial herbaceous plant some 7 to 10 dm (28 to 40 in) tall with 1 to 3 stems arising from a woody root-stock. The stems are glabrous, leafy, and openly branched in their upper halves. The leaves are somewhat leathery, dark green, and dotted with resinous glands. Basal leaves are oblanceolate and 4 to 7 cm (1.6 to 2.8 in) long while the stem leaves are oblanceolate to oblong and 1.5 to 5 cm (0.6 to 2 in) long. The leaf edge is entire to somewhat toothed at the apex.

The inflorescence is open with individual heads 8 to 10 mm across. The involucres are 7 to 9 mm high with 3 to 7 mm long phyllaries that are resinous dotted. The ray flowers are mostly 13 per head, with the corolla golden to lemon yellow and 3 to 4.5 mm long. The disk flowers are 4 to 5 mm long and golden yellow.

The achenes are 2.5 to 3.5 mm long and bear 2 stout awns which are 3 to 4 mm long.

The related *Grindelia hallii* Steyerm. is a smaller plant, 3 to 6 dm (12 to 24 in) tall, with toothed leaves and 13 to 21 ray flowers per head.

Flowering from June to October.

HABITAT: Roadsides, meadows, or woodland borders; saline soil, especially in depressions and in saturated soils next to standing water. Associated plants: *Atriplex confertifolia, Centaurium namophilum, Tamarix* sp., *Anemopsis californica,* and *Haplopappus acradenius*. Elevation: 640-700 m (2100-2300 ft).

KNOWN DISTRIBUTION: Nye County, Nevada. Inyo County, California.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Utilization of land for agricultural or other developmental purposes. Diversion of water for agricultural uses. Proposed MX system (indirectly).

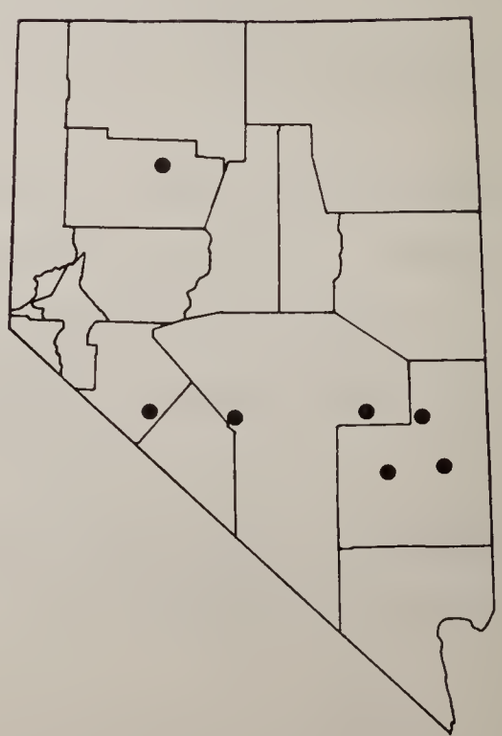
REMARKS: Although much of the original habitat for *Grindelia fraxino-pratensis* has been destroyed, it appears to be able to become established in disturbed soil.

MACHAERANTHERA LEUCANTHEMIFOLIA

4 mm

1 cm

1 mm



MACHAERANTHERA LEUCANTHEMIFOLIA (Greene) Greene
White Leaf Machaeranthera

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Machaeranthera leucanthemifolia* (Greene) Greene, Pittonia, 3:61. 1896. Synonym: *Aster leucanthemifolius* Greene, Erythrea, 3:119. 1895. Type: Shockley, near Candelaria (Mineral County), NV, 6000 ft. The specific name, *leucanthemifolia*, means having white foliage.

DESCRIPTION: A short-lived perennial with pale gray, more or less glandular and spiny-toothed leaves. The branched stems reach a height of 4 dm (16 in) and like the leaves are ashy-pubescent. Basal leaves are 2 to 3 cm (0.8 to 1.2 in) long while the clasping stem leaves are somewhat smaller.

The 6 to 7 mm high flower heads are ashy-pubescent and glandular. There are 8 to 15 pale purple rays 6 to 8 mm long. The achenes are pubescent, about 3 mm long, and crowned with a tuft of brownish-white hairs.

A taxonomic question has been raised concerning *Machaeranthera leucanthemifolia*. The above description follows the treatment in Munz and Keck (1959). *M. canescens* (Pursh) Gray can be separated by its leaves which are better developed on the stem rather than being reduced to mere bracts, flowering heads which are more numerous and tending to be larger, and involucral bracts which are prominently curled backward at the tip. *M. tortifolia* (Gray) Cronq. & Keck grows in the same general area, however, this latter species is not as glandular, has longer, relatively narrower leaves, is not pale ashy-gray in color, and has much larger flowering heads (12 to 16 mm high).

Flowering in May and June.

HABITAT: Fine gravelly soil, outwash fans. Associated plants: *Larrea tridentata, Atriplex confertifolia, Halogeton glomeratus, Chrysothamnus* sp., and *Viguiera multiflora*. Elevation: 670-1830 m (2200-6000 ft).

KNOWN DISTRIBUTION: Lincoln, Mineral, Nye, and Pershing counties, Nevada. California.

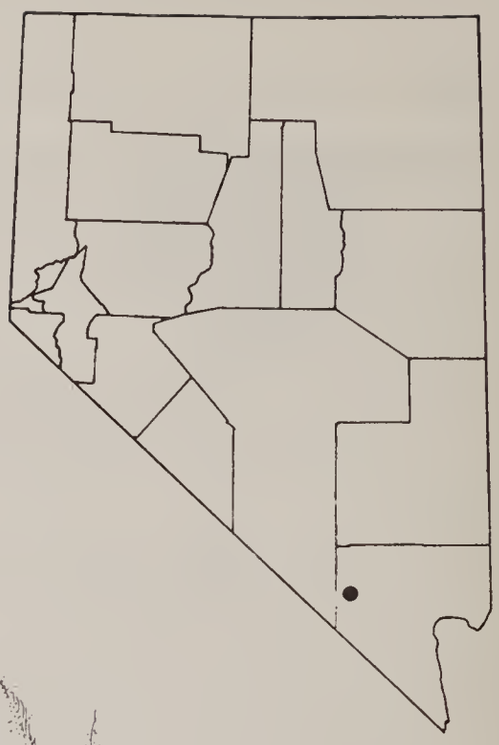
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979); deleted (Mozingo and Williams).

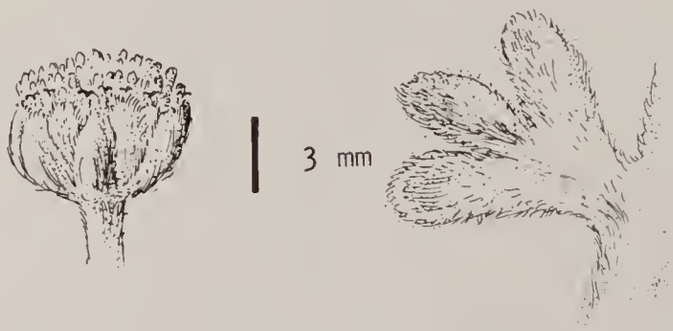
LAND OWNERSHIP/MANAGEMENT: BLM, State of Nevada, possibly USFS, and private.

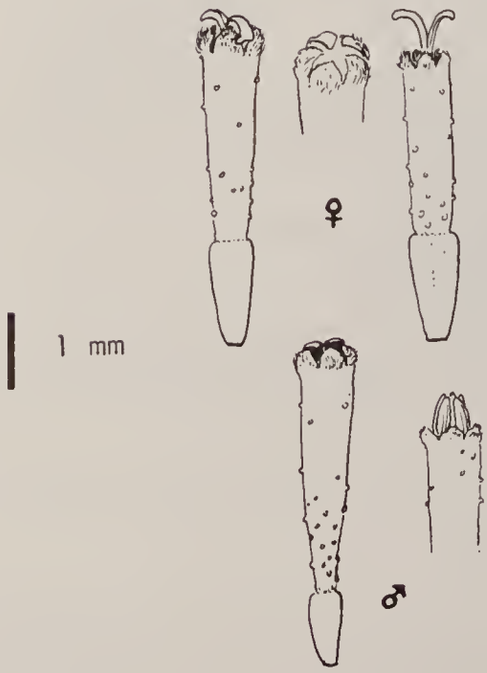
EXISTING OR POTENTIAL THREATS: Proposed MX system.

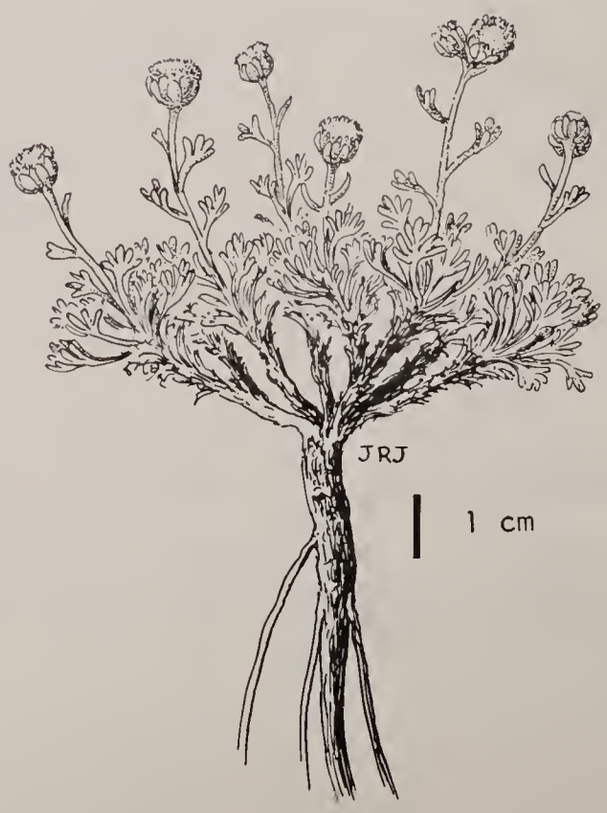
REMARKS: This species was recommended to be deleted because of its widespread distribution. However, known populations should be monitored until the MX sytem sites are located.

SPHAEROMERIA COMPACTA









SPHAEROMERIA COMPACTA (Hall) Holmgren, Shultz & Lowrey
Charleston Tansy

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Sphaeromeria compacta* (Hall) Holmgren, Shultz & Lowrey, Brittonia, 28:261. 1976. Synonyms: *Tanacetum compactum* H.M. Hall, Muhlenbergia, 2:343. 1916. *Chamartemisia compacta* (Hall) Rydb., North American Flora, 34:243. 1916. Type: Heller, Charleston (Spring) Mountains, 3300 m, 15 August 1913. The specific name, *compacta*, refers to the compact tufting habit of these plants.

DESCRIPTION: A densely tufted, silvery-silky perennial with fan-shaped, divided leaves up to 15 mm long. The leaves possess four to nine lobes 2 to 5 mm long. The flowering heads are borne singly on stems 2 to 4 cm (0.8 to 1.6 in) tall. The basal bracts on the heads possess thin margins tinged with pink, but are generally white with a dark brown midrib and are silky pubescent.

The strap-shaped ray flowers at the margin of the head number 5 to 10, while the center of the head contains many straw-colored disk flowers. After the flowers are removed from the head, the area to which they were attached (the receptacle) will be seen to have no hairs or scales.

The fruiting structures or achenes are smooth and support five awl-shaped scales at the top.

From the somewhat similar *Sphaeromeria potentilloides* (Gray) Heller this species can be distinguished by the lack of pubescence on the receptacle and the narrower disk flowers which have densely pubescent teeth.

Flowering in late July and August.

HABITAT: On gravelly hillsides or in crevices of limestone; talus slopes at timberline or above. Associated plants: *Pinus longaeva, Ivesia cryptocaulis, Oxytropis oreophila, Draba jaegeri, Aquilegia scopulorum,* and *Erigeron clokeyi.* Elevation: 3000-3520 m (9840-11,550 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

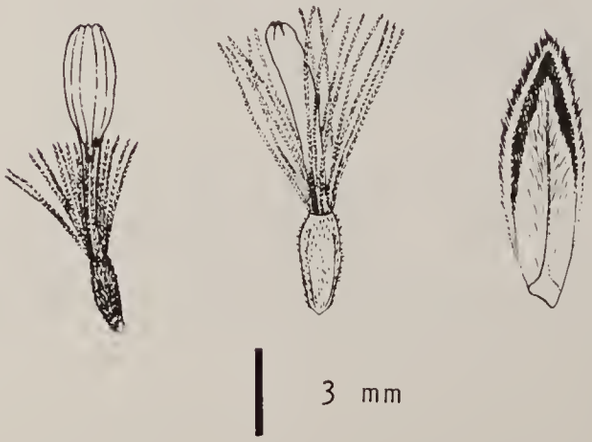
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); threatened (Reno T/E Workshop, 2 Nov 1979).

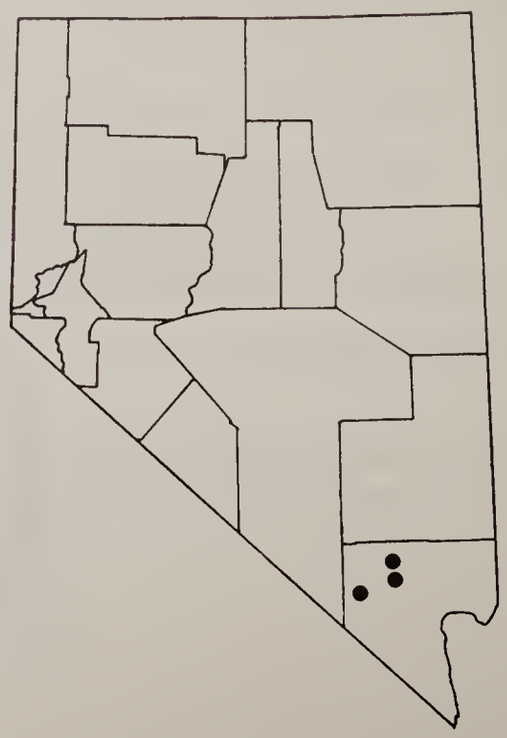
LAND OWNERSHIP MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Free roaming horses and foot-traffic on unstable slopes. Proposed MX system (indirectly).

REMARKS: The increasing population in the Las Vegas area will increase the hazards to the plants in the Spring Mountains.

TOWNSENDIA JONESII var. TUMULOSA





TOWNSENDIA JONESII (Beaman) Reveal var. TUMULOSA Reveal
Charleston Ground-daisy

FAMILY: Asteraceae (Compositae) -- Sunflower Family

CITATION AND HISTORY: *Townsendia jonesii* (Beaman) Reveal var. *tumulosa* Reveal, The Great Basin Naturalist, 30:35. 1970. Type: Reveal, Charleston (Spring) Mountains, Clark County, Nevada, 8400 ft, 17 June 1968. This species had been collected many times previously, and had been treated by Clokey, "Flora of the Charleston Mountains, Clark County, Nevada," as *Townsendia arizonica* Gray. The varietal name, *tumulosa*, refers to the mounding habit of the plant.

DESCRIPTION: A rosette-forming perennial with oblanceolate to spatulate leaves up to 2.5 cm (1 in) long by 2 to 4 mm wide. The leaves are entire and acute, and usually uniformly hairy on both surfaces.

The flowering heads have mostly short peduncles with involucral bracts which are broadly lanceolate to obovate with thin, dry, and hair-fringed margins. The bracts are glabrous to slightly hairy on the outer surfaces. Ray flowers are white or pink or violet and number from 13 to 21. Individual ray flowers vary from 8 to 12 mm long by about 1 mm wide. The yellow disk flowers are usually purplish-tinged at the tip and vary in length from 4 to 6 mm.

The achenes are oblanceolate compressed, and 2 or sometimes 3 ribbed. They are hairy and possess 15 to 30 pappus bristles at their apex.

This variety differs from the related var. *jonesii* of the same species in its shorter and wider leaves, its shorter (to 1.5 cm) peduncles and the obtuse rather than pointed involucral bracts.

Flowering from March to June.

HABITAT: On ridges, slopes, saddles, and washes in open places away from shrubs. Associated plants: *Pinus monophylla*, *P. ponderosa* var. *scopulorum*, *P. longaeva*, *Artemisia nova*, *Abies concolor*, *Cercocarpus* sp., *Penstemon thompsoniae* var. *jaegeri*, or *P. keckii*. Elevation: 1980-3050 m (6500-10,000 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov. 1979).

LAND OWNERSHIP/MANAGEMENT: USFS, USFWS, and private.

EXISTING OR POTENTIAL THREATS: Increased recreational use in the Spring Mountains. Proposed MX system (indirectly).

REMARKS: There is no threat to this taxon in the Desert National Wildlife Range as long as present management policies continue.

3 mm
7 mm
1 mm
JRJ

CRYPTANTHA HOFFMANNII I.M. Johnston
Hoffmann Cryptantha

FAMILY: Boraginaceae -- Borage Family

CITATION AND HISTORY: *Cryptantha hoffmannii* I.M. Johnston, Contributions from the Arnold Arboretum, 3:90. 1932. Type: Hoffmann, Westgard Pass, Inyo County, CA, 7300 ft, 11 July 1930. This species was named for the collector of the type, Ralph Hoffmann.

DESCRIPTION: A biennial plant becoming 3.4 dm (13.6 in) tall with one to several conspicuously hairy stems bearing spatulate leaves which are larger at the base and reduced upwards. The leaves are rough-hairy and bristly on both surfaces.

The inflorescence is broad-topped and interrupted with apparent floral bracts. The lanceolate calyx segments are 3 to 5 mm long at the time of flowering and become 5 to 8 mm long in fruit. The white flowers have a tube 3 to 4 mm long and an expanded portion 5 to 7 mm wide. At the base of each lobe at the point of juncture with the tube is a yellow, rounded appendage 0.5 mm long.

The two to four nutlets are roughened and have a low inconspicuous crest on the outer surface. The inner surface has a triangular, open scar without an elevated margin.

From the similar and possibly extinct *C. insolita* (Macbr.) Payson this species may be distinguished by its denser, less elongate inflorescence and by conspicuous, rather than inconspicuous, appressed bristles. From the common *C. virginensis* (Jones) Payson it may be separated by the former's longer calyx lobes in fruit (7 to 12 mm compared to 5 to 8 mm), larger nutlets (3 to 4.5 mm compared to 2.5 to 3 mm long) with a prominent rather than indistinct keel on the outside.

Flowering from June to August.

HABITAT: Volcanic soils, rocky open slopes, or on diatomite. Associated plants: sagebrush-pinyon-juniper, *Purshia* sp. Elevation: 1830-1950 m (6000-6400 ft).

KNOWN DISTRIBUTION: Esmeralda, Mineral, and Nye counties, Nevada. Inyo Co., California.

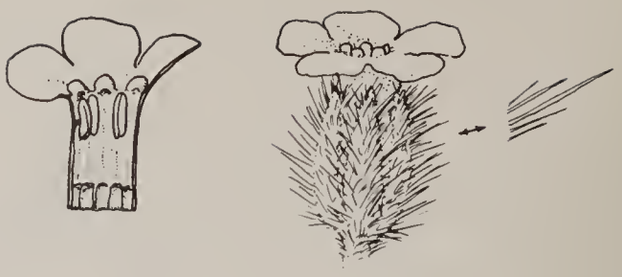
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

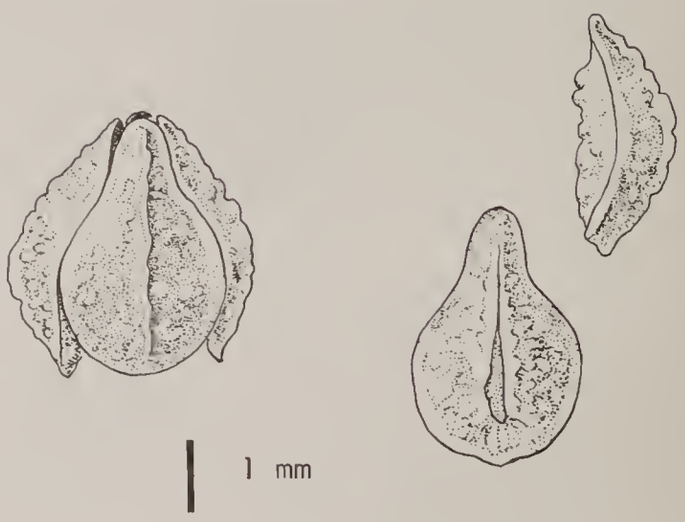
LAND OWNERSHIP/MANAGEMENT: BLM, DOE (Tonopah Test Range), and possibly private.

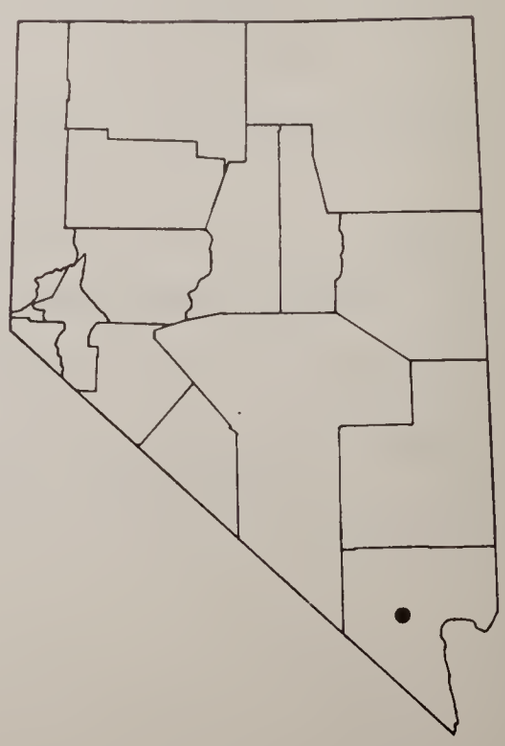
EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: More study is needed to understand the habitat and edaphic requirements of this rare plant. It was searched for unsuccessfully at the location of the Mineral County collection.

CRYPTANTHA INSOLITA







CRYPTANTHA INSOLITA (Macbr.) Pays.
Las Vegas Cryptantha

FAMILY: Boraginaceae -- Borage Family

CITATION AND HISTORY: *Cryptantha insolita* (Macbr.) Payson, Annals of the Missouri Botanical Garden, 14:273. 1927. Synonym: *Oreocarya insolita* Macbride, Contributions from the Gray Herbarium, 48:28. 1916. Type: Goodding, Las Vegas, Clark County, Nevada, 4 May 1905. The specific name, *insolita*, means unusual, possibly referring to the habit of the plant.

DESCRIPTION: A biennial or short-lived perennial plant which attains a height of up to 4 dm (16 in). There are one to several stems which are pubescent with appressed hairs and bristles. The mostly basal leaves are spatulate, blunt at the tip and up to 3 cm (1.2 in) long. The lower surface of the leaf is inconspicuously pubescent with appressed bristles, while the upper surface is more sparsely pubescent.

The elongate, open inflorescence is weakly bristly and crowded with flowers. The linear-lanceolate calyx segments become 7 to 9 mm long in the fruiting stage. The white flowers have a tube 3 to 4 mm long. The one to four nutlets produced by each flower are about 4 mm long and distinctly keeled on the outer face and bearing short tubercles.

From the similar *C. virginensis* (Jones) Payson, *C. insolita* differs significantly in its appressed bristles on the leaf rather than spreading, and by blunt tubercles rather than sharp ones. From *C. tumulosa* (Pays.) Pays. it can be separated by the distinct rather than slight keel and by the more prominent tubercles on the outer face of the nutlet. *C. tumulosa*, also, is much more obviously a perennial.

Flowering from April to June.

HABITAT: Not definitely known. Possibly saline clay soil with gypsum outcrops; lower part of the Upper Sonoran Zone. Elevation: 305-610 m (1000-2000 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

STATUS: Possibly extinct (1975 *FR*); endangered (1975 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required. Possibly extinct (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: BLM and/or private.

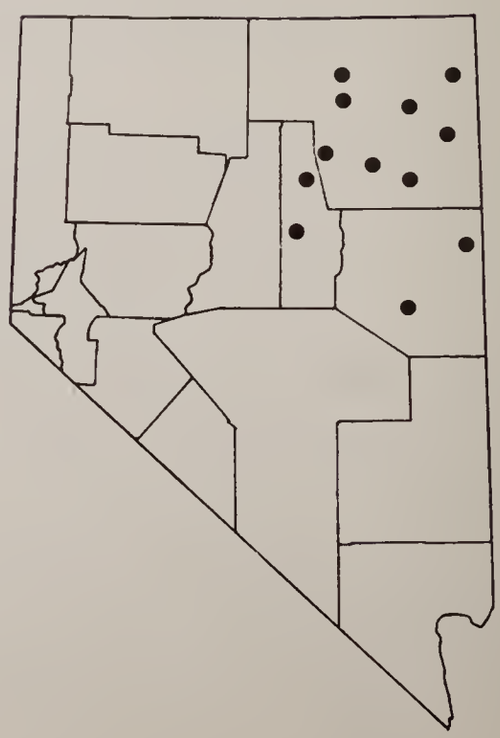
EXISTING OR POTENTIAL THREATS: Urban expansion. Proposed MX system (indirectly).

REMARKS: The last known collection of *Cryptantha insolita* was in 1942, the type is the only other known collection. This taxon has been searched for recently without success. Although it is the recommendation of Mozingo and Williams that this taxon should be considered to be possibly extinct, the search for it should be continued whenever possible.

CRYPTANTHA INTERRUPTA

1 mm

3 mm



CRYPTANTHA INTERRUPTA (Greene) Pays.
Interrupted Cryptantha

FAMILY: Boraginaceae-- Borage Family

CITATION AND HISTORY: *Cryptantha interrupta* (Greene) Payson, Annals of the Missouri Botanical Garden, 4:296. 1927. Synonym: *Oreocarya interrupta* Greene, Pittonia, 3:111. 1896. Type: Lost or destroyed. Neotype: Higgins, east of Wells, Elko County, Nevada, 13 July 1968. The spacing of the flowers in the inflorescence gives rise to the common name and to the specific name, *interrupta*.

DESCRIPTION: A long-lived perennial which may reach 6 dm (24 in) in height. The few to several stems are clothed with appressed hairs and weak white bristles. The leaves are oblanceolate to spatulate, obtuse and 1.5 to 7 cm (0.6 to 2.8 in) long, with both surfaces covered with appressed hairs and weak bristles, with the latter somewhat more prominent on the lower surface.

The inflorescence is narrow, interrupted, and densely prickly hairy. The calyx segments are 2 to 3 mm long at flowering and become 5 to 8 mm long in fruit. The corolla is white with a tube 2 to 2.5 mm long and an expanded portion 5 to 6 mm wide. Yellow appendages 0.5 mm long are present at the point where the expanded portion joins the tube.

The four nutlets are lanceolate, 3.3 to 3.6 mm long, with nearly smooth to warty surfaces, and a linear, slightly open scar on the inner surface.

This species can be distinguished from somewhat similar perennial species by the combination of linear nutlet scars only slightly open, a nutlet surface with a warty appearance rather than wrinkled, and the upper leaf surface with two distinct kinds of hairs. *Cryptantha interrupta* is a questionable taxonomic entity according to some recent floristic works (Hitchcock et al. 1959) and has been combined with *C. spiculifera* Pays. Until a new systematic monograph of the genus appears, we have adopted a conservative position on this species, primarily to draw attention to the existence of the Nevada populations.

Flowering in May and June.

HABITAT: Rocky hillsides, sandy or clay soils. Associated plants: sagebrush-pinyon-juniper, *Chrysothamnus viscidiflorus*, *Oryzopsis hymenoides*, *Phlox* sp., and *Astragalus* sp. Elevation: 1495-2410 m (4900-7900 ft).

KNOWN DISTRIBUTION: Elko, Eureka, and White Pine counties, Nevada.

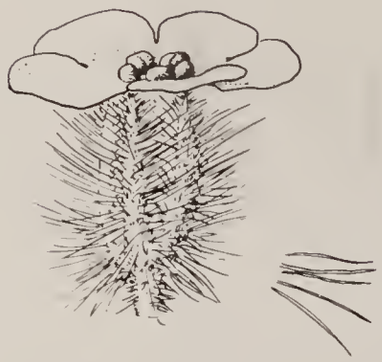
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, USFS, and possibly private.

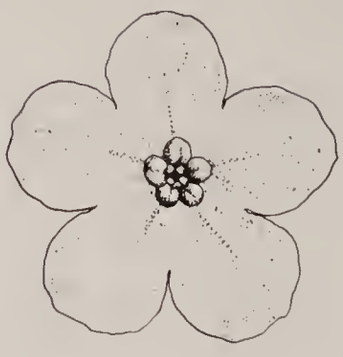
EXISTING OR POTENTIAL THREATS: Proposed MX system.

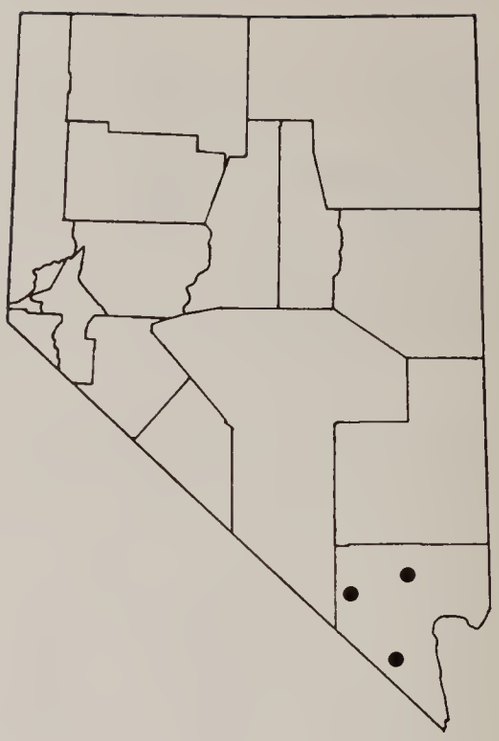
REMARKS: *C. interrupta* is rather widely distributed and it apparently thrives in disturbed soil. It is unlikely that the MX system will have an impact on all the populations of this taxon.

CRYPTANTHA TUMULOSA



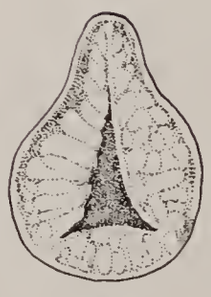
3 mm





1 cm

3 mm



1 mm

CRYPTANTHA TUMULOSA (Pays.) Pays.
Mohave Cryptantha

FAMILY: Boraginaceae -- Borage Family

CITATION AND HISTORY: *Cryptantha tumulosa* (Payson) Payson, Annals of the Missouri Botanical Garden, 14:276. 1927. Synonym: *Oreocarya tumulosa* Payson, University of Wyoming Publications in Botany, 1:164. 1926. Type: Brandegee, Providence Mountains, San Bernardino County, CA, May 1902. The specific name, *tumulosa*, refers to the mounding habit of the plants.

DESCRIPTION: A long lived perennial reaching a height of nearly 3 dm (12 in) with one or several coarsely pubescent and bristly stems arising from a woody taproot. The basal leaves are numerous, oblanceolate, obtuse and 3 to 5 cm (1.2 to 2 in) long on slender, long petioles. Conspicuous pimples or "pustules" occur on both leaf surfaces.

The narrow, uninterrupted inflorescence occupies one-half to three-fourths of the stem length. The densely bristly inflorescence bears white flowers with linear lanceolate sepals initially 4 mm long, but becoming 8 to 10 mm long in fruit. There are conspicuous yellow appendages in the throat of the flower 0.5 to 1 mm long, while the expanded portion of the corolla is 6 to 8 mm wide.

Only 1 or 2 of the four nutlets mature and become 4 mm long, and very pale with the outer surface somewhat roughened or warty. The inner surface of the nutlet (i.e. that part nearest the central axis of the fruiting structure) bears a triangular scar with a margin which is only slightly raised.

The only other species in the same general area with which this might be confused is *C. virginensis* (Jones) Pays. which has a broad, open inflorescence and nutlets with a prominent ridge on the outer surface.

Flowering from April to June.

HABITAT: Gravelly clay soils, on limestone hills and in washes. Associated plants: *Artemisia* sp., *Cercocarpus ledifolius*, *Juniperus osteosperma*, and *Pinus monophylla*. Elevation: 1370-2165 m (4500-7100 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. San Bernardino County, California.

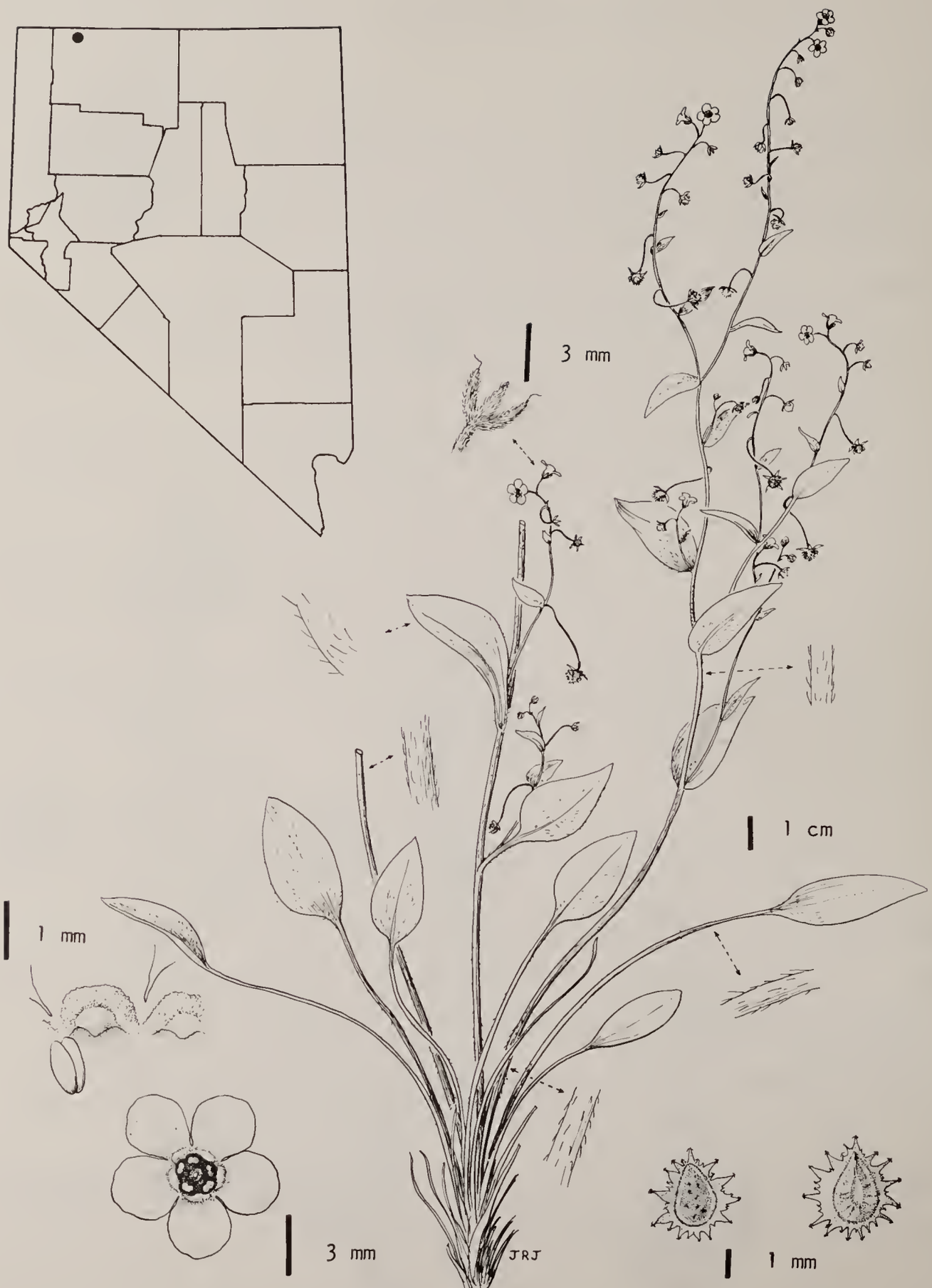
STATUS: Threatened (1975 *FR*): threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, USFS, USFWS, and private.

EXISTING OR POTENTIAL THREATS: Recreational use of the areas in the Spring Mountains where *Cryptantha tumulosa* has been found. Proposed MX system (indirectly).

REMARKS: Recent collections in the Desert National Wildlife Range have lessened the vulnerability of this taxon. A further search should be made to determine the full distribution of this *Cryptantha*.

HACKELIA OPHIOBIA



HACKELIA OPHIOBIA R.L. Carr
Owyhee River Stickseed

FAMILY: Boraginaceae -- Borage Family

CITATION AND HISTORY: *Hackelia ophiobia* R.L. Carr, Madroño, 22:390. 1974. Type: Carr, Malheur Co., Oregon, 30 June 1968.
The derivation of the specific name, *ophiobia*, is obscure. The root, *ophio-*, comes from the Greek and means pertaining to snakes. The name may have been chosen because this plant grows in the Snake River drainage or perhaps because its rocky habitat may also be the home of snakes.

DESCRIPTION: A slender perennial with a few to several stems reaching a height of 2 to 4 dm (8 to 16 in). The leaves and stems are pubescent, with the leaves uniformly so on both surfaces. The basal leaves are broad and 5 to 15 cm (2 to 6 in) long, while the stem leaves are only somewhat smaller.

The flowers are blue with a yellow to cream throat and about 6 to 8 mm wide. The calyx consists of linear-lanceolate pubescent segments which are 3 to 4 mm long. Individual flower stalks are 12 to 17 mm long in fruit.

The four nutlets produced by each flower are 2.2 to 3.3 mm long with a roughened surface and prominent marginal prickles.

No other species of *Hackelia* in the west has basal leaves as proportionately broad with a base so truncate or indented. Its flowers and nutlets differ from those of *Hackelia cusickii* (Piper) Brand in that the latter species has flowers 5 to 10 mm broad and nutlets which have more prickles on the outer surface.

Flowering in June.

HABITAT: Well-shaded sandy talus, in cracks and crevices of rocky basaltic bluffs and cliffs; banks of a gorge along a creek. Associated plants: this taxon grows in barren areas, but nearby can be found *Artemisia tridentata, Chrysothamnus viscidiflorus, Symphoricarpos longiflorus, Poa ampla, Elymus cinereus,* and *Allium bisceptrum.* Elevation: 1220-1400 m (4000-4600 ft).

KNOWN DISTRIBUTION: Humboldt County, Nevada. Malheur County, Oregon.

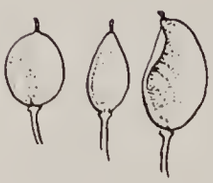
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFWS.

EXISTING OR POTENTIAL THREATS: Destruction of habitat by stream water level fluctuation.

REMARKS: *Hackelia ophiobia* is only known in Nevada from one small population which should be monitored. It should be searched for in similar habitats.

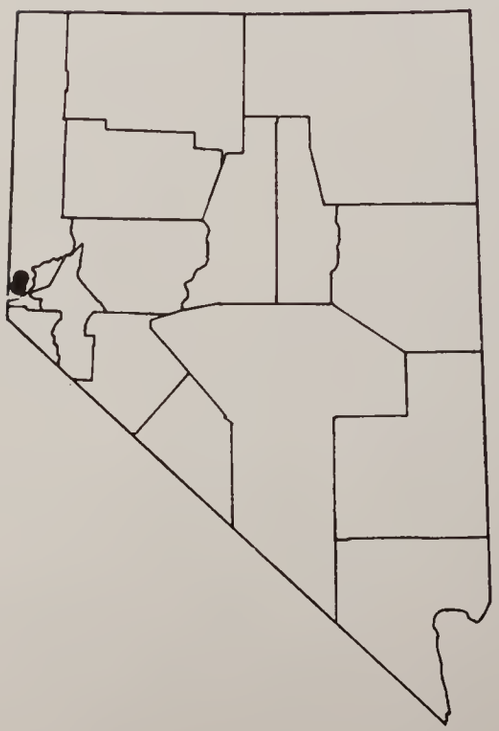
DRABA ASTEROPHORA var. ASTEROPHORA

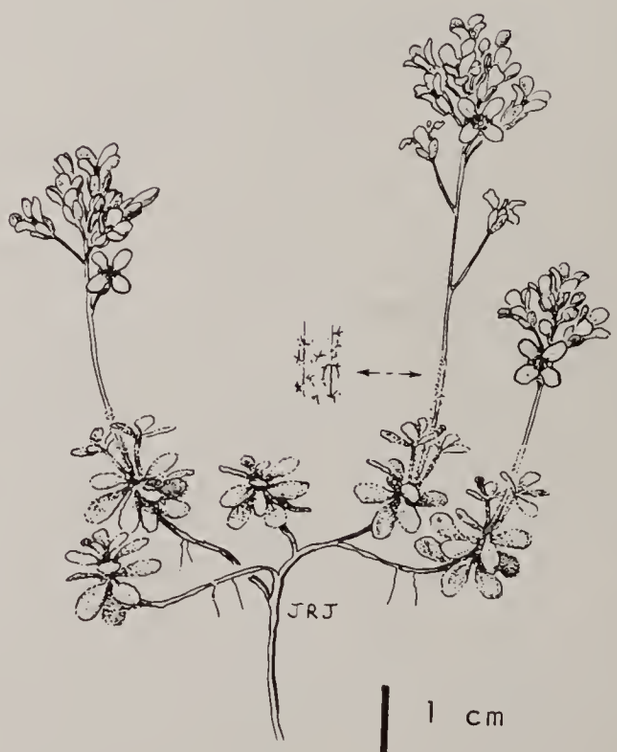


1 cm

5 mm

2 mm





1 cm

DRABA ASTEROPHORA Payson var. ASTEROPHORA
Star Draba

FAMILY: Brassicaceae (Cruciferae) -- Mustard Family

CITATION AND HISTORY: *Draba asterophora* Payson var. *asterophora*, American Journal of Botany, 4:263. 1917. Type: Kennedy, Mt. Rose, Washoe County, Nevada, 9000 ft, 17 August 1905. The specific name, *asterophora*, and the common name refer to the star-shaped hairs on the plants.

DESCRIPTION: A loosely tufted perennial with some rather long trailing vegetative branches. The leaves are obovate to oblanceolate, about 1 cm long and 4 to 5 mm wide. The sparse pubescence consists of long stalked cross-shaped or stellate hairs.

The flowering stalks are slender, smooth, 3 to 4 cm (1.2 to 1.6 in) long, and with a short raceme bearing 10 to 25 yellow flowers.

The broad pods are 5 to 13 mm long and 3 to 6 mm broad, flattened, and hairless. The style at the top of the pod is short, about 0.5 mm, but varying from 0.25 to 1 mm. The distinctive seeds are 2 mm long and possess a nearly complete thin wing about 0.5 mm broad.

The var. *macrocarpa* C.L. Hitchc. of this species has styles 1 to 2 mm long, and pods which are 10 to 15 mm long. From the similar *Draba lemmonii* S. Wats. and *D. cyclomorpha* Pays. this species may be separated by its winged seeds and stellate pubescence.

Flowering from June to August.

HABITAT: Loose hillsides and slopes of decomposed granite. Associated plants: *Tsuga mertensiana, Pinus murrayana, P. albicaulis, P. monticola,* and *Abies concolor.* Elevation: 2175-3260 m (8900-10,700 ft)

KNOWN DISTRIBUTION: Washoe County, Nevada. California.

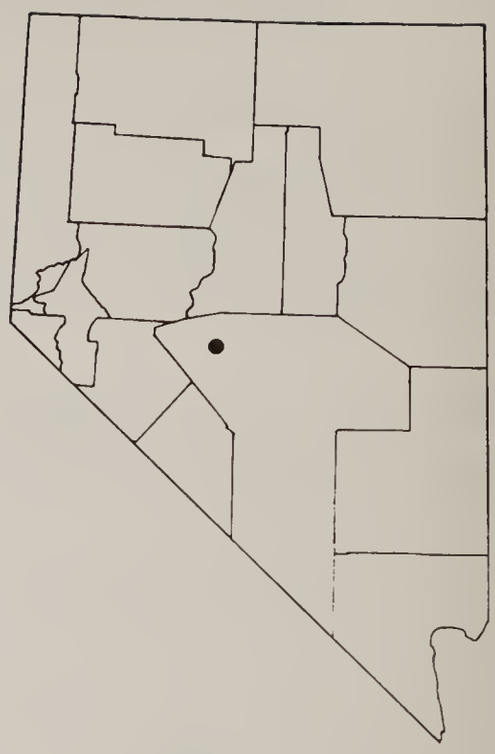
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

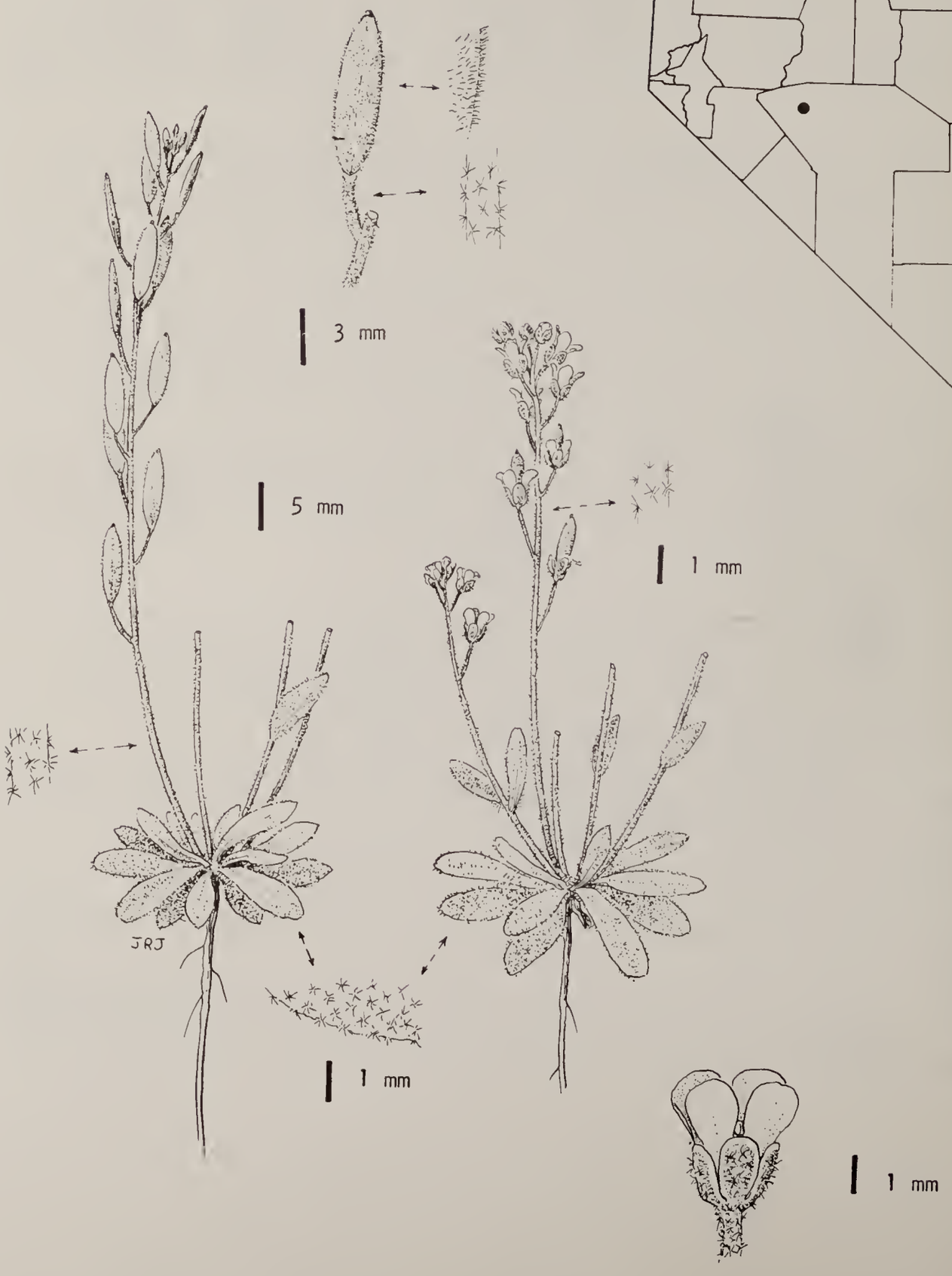
LAND OWNERSHIP/MANAGEMENT: State of Nevada, USFS, and private.

EXISTING OR POTENTIAL THREATS: Disturbance of unstable slopes by recreational activities.

REMARKS: The full range of *Draba asterophora* var. *asterophora* should be determined. Natural forces could disturb the unstable slopes possibly more than man does.

DRABA CRASSIFOLIA var. NEVADENSIS





DRABA CRASSIFOLIA R. Grah. var. NEVADENSIS C. L. Hitchc.
Arc Dome Draba

FAMILY: Brassicaceae (Cruciferae) -- Mustard Family

CITATION AND HISTORY: *Draba crassifolia* var. *nevadensis* C. L. Hitchcock, University of Washington Publications in Biology, 2:105. 1941. Type: Hitchcock and Martin, N of Arc Dome, Nye County, Nevada, 7000 ft, 1 August 1939. The common name was chosen because the type specimen was collected near Arc Dome.

DESCRIPTION: A low biennial or perennial with one or several crowns and one to several pubescent stems 2 to 20 cm (0.8 to 8 in) tall. The linear-spatulate or slightly wider leaves are 10 to 25 mm (0.4 to 1 in) long and lightly pubescent.

The yellow flowers are borne on 3 to 20 flowered inforescences with one or two leaves on the stem. The sepals are 1 mm long while the petals average 2 to 3 mm in length. The flowers are borne on pubescent individual flower stalks 2 to 10 mm long.

The capsules are narrowly elliptic to somewhat lanceolate, 5 to 12 mm long, and densely pubescent with short simple hairs.

Draba densifolia Nutt. is a similar linear leaved species but has nearly hairless stems, leafless flowering stems, bigger flowers, and capsules pubescent with both simple and stellate hairs.

Flowering from May to August.

HABITAT: Rocky places along a creek; alpine fell fields. Associated plants: *Artemisia tridentata* and *Grayia spinosa*. Elevation: 1585-3505 m (5200-11,500 ft).

KNOWN DISTRIBUTION: Nye County, Nevada. California.

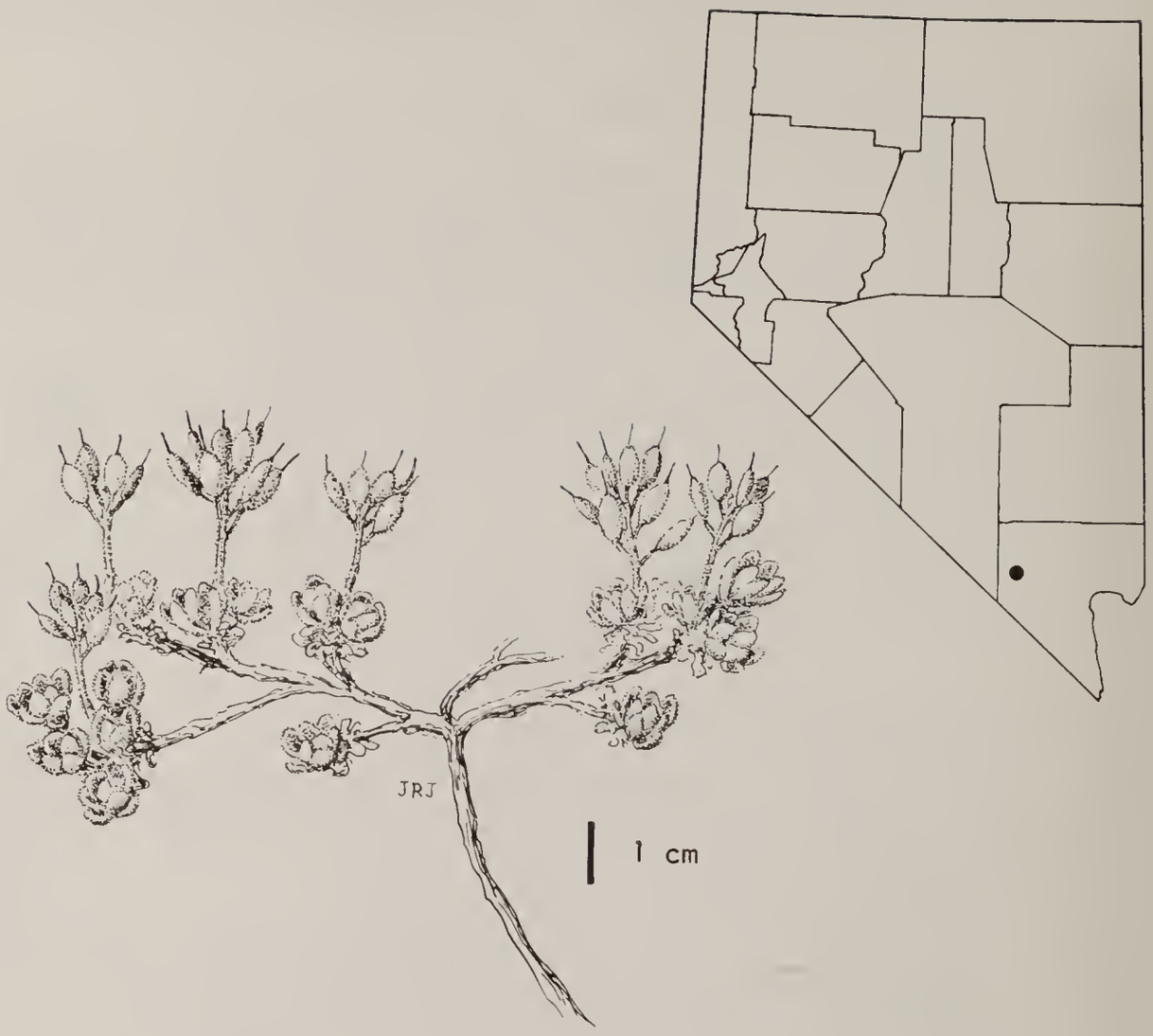
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: State of Nevada and USFS..

EXISTING OR POTENTIAL THREATS: None known.

REMARKS: Until more is known about the edaphic requirements and abundance of this taxon, it is impossible to evaluate its status. A search should be made to determine its distribution and the threats, if any, to it. It is apparently rare in Nevada.

DRABA JAEGERI



DRABA JAEGERI Munz & Johnston
Jaeger Draba

FAMILY: Brassicaceae (Cruciferae) -- Mustard Family

CITATION AND HISTORY: *Draba jaegeri* Munz & Johnston, Bulletin of the Torrey Botanical Club, 56:164. 1929. Type: Jaeger, Charleston (Spring) Mountains, Clark Co., Nevada, 11,000 ft, 26 June 1926. This species was named for Edmund C. Jaeger who collected the type specimen.

DESCRIPTION: A clumped perennial with narrowly obovate leaves 4 to 6 mm long and 3 to 4 mm wide. They are pubescent with stellate hairs, have marginal hairs and a grayish cast.

The inflorescence is 2 to 5 cm (0.8 to 2 in) long with a cluster of white flowers 1 to 1.5 cm long. Individual flowers have purplish, pubescent sepals 2.5 mm long and petals 5 to 6 mm long.

The individual capsule stalks are 4 to 6 mm long while the capsules are flattened and densely stellate-pubescent and 4 to 6 mm long.

This *Draba* can be separated from similar appearing species by the leafless inflorescence stalks, stellate pubescence, relatively wide leaves, seeds without wings, and particularly by the relatively long (2 mm) style.

Flowering from June to August.

HABITAT: Rock crevices; among broken limestone rocks, and on gravelly slopes. Associated plants: *Pinus longaeva*; or above timberline with *Ivesia cryptocaulis*, *Sphaeromeria compacta*, *Oxytropis oreophila*, and *Aquilegia scopulorum*. Elevation: 2990-3580 m (9810-11,740 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

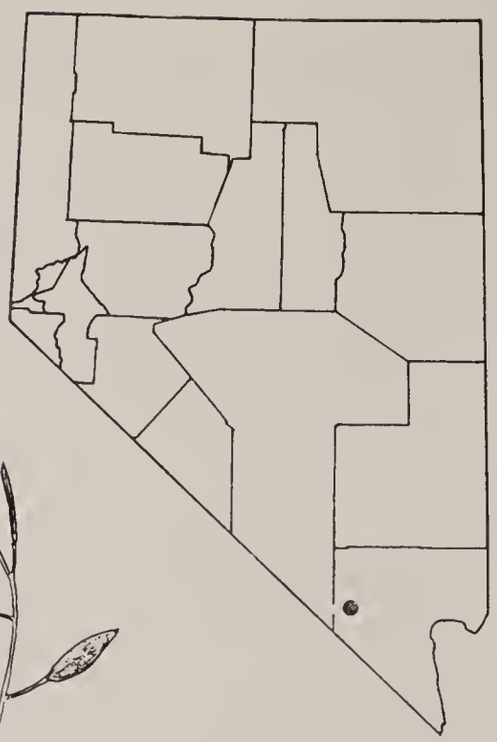
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: USFS and possibly private.

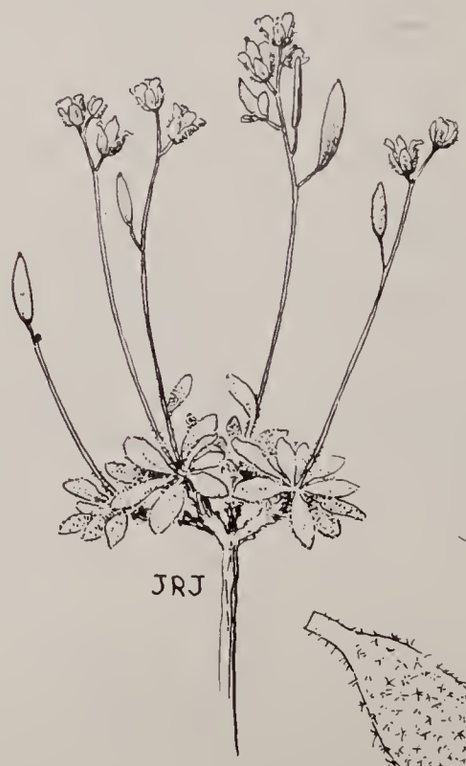
EXISTING OR POTENTIAL THREATS: Free roaming horses and foot-traffic on unstable slopes. Proposed MX system (indirectly).

REMARKS: The expanding population in southern Nevada will increase the impact on plants in the Spring Mountains.

DRABA PAUCIFRUCTA

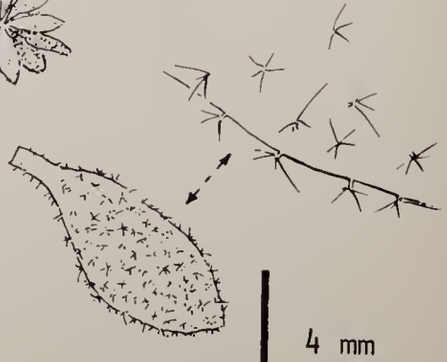


1 mm



JRJ

5 mm



4 mm

DRABA PAUCIFRUCTA Clokey & C.L. Hitchc.
Charleston Draba

FAMILY: Brassicaceae (Cruciferae) -- Mustard Family

CITATION AND HISTORY: *Draba paucifructa* Clokey & C.L. Hitchc., Madroño, 5:127. 1939. Type: Clokey, Charleston (Spring) Mountains, Clark County, Nevada, 3180 m, 3 August 1938. The specific name, *paucifructa*, refers to the few fruits of this species.

DESCRIPTION: A low perennial with one to several crowns of leaves, with each crown giving rise to one to four glabrous stems. The leaves are mostly in basal rosettes, obovate or slightly narrower, with entire edges or faintly toothed, 3 to 15 mm long and densely pubescent with stellate hairs.

The elongate inflorescence bears relatively few flowers (3 to 12), on individual flower stalks 1 to 5 mm long. The pubescent sepals are 1.5 mm long and the white petals are almost spatulate and about 2.5 mm long. Characteristically the petals are light yellow as the flower begins to open, but this color is soon lost.

The capsules are linear-lanceolate to slightly broader and 5 to 11 mm long with a very short style at the tip (0.1 to 0.3 mm).

This species differs from the similar *D. crassifolia* R. Grah. in that the latter has leaves which are smooth or only sparsely hairy and flowers which are yellow when fully open and turn white only upon fading. *D. stenoloba* Ledeb. differs in being an annual or short-lived perennial with pubescent stems and yellow flowers.

Flowering in June and July.

HABITAT: Moist places, rock ledges, seep areas. Associated plants: *Heuchera rubescens*, *Dodecatheon jeffreyi* var. *redolens*, and growing near *Pinus longaeva* and *P. flexilis*. Elevation: 2710-3470 m (8900-11,380 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

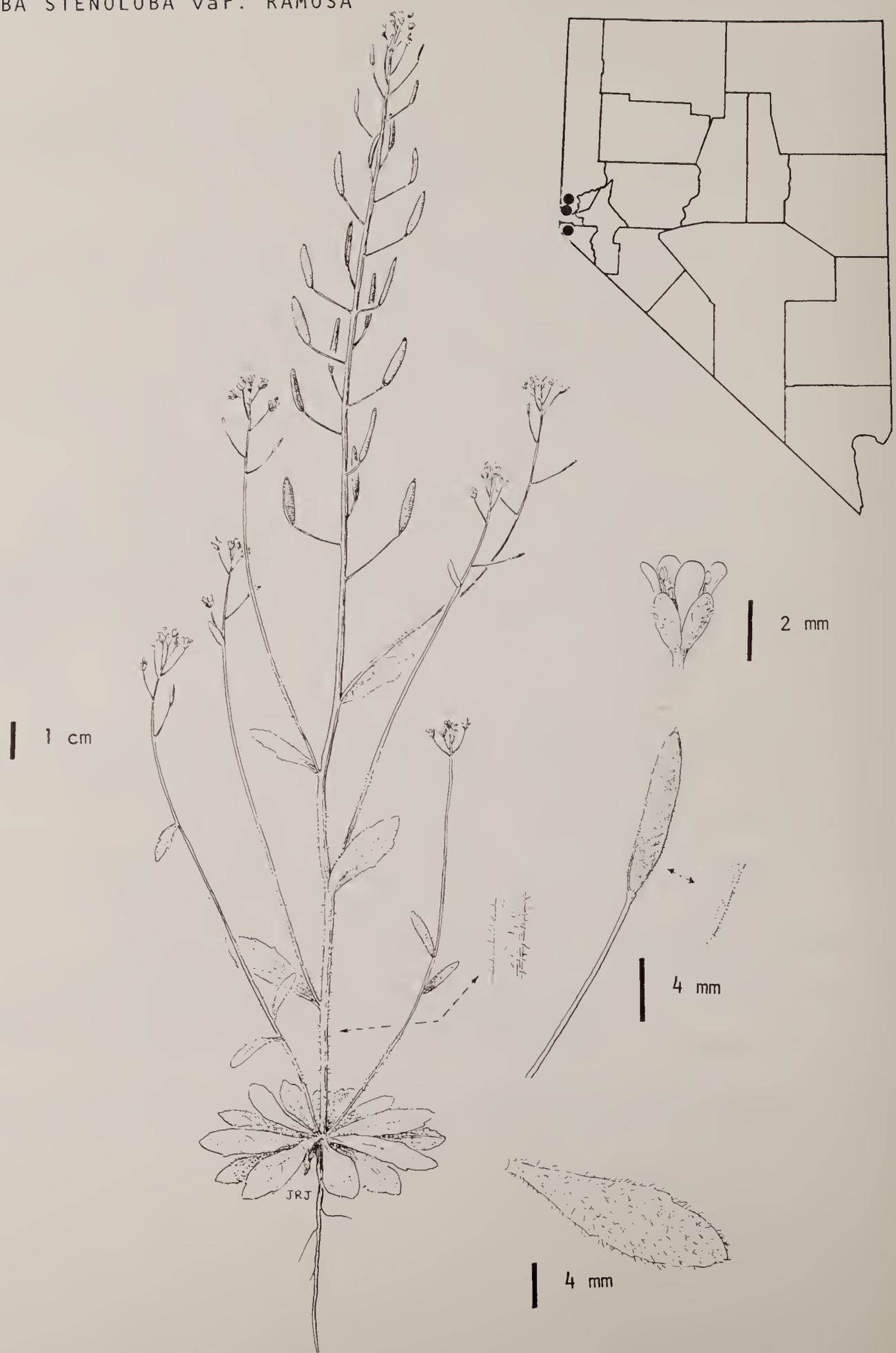
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: USFS and possibly private.

EXISTING OR POTENTIAL THREATS: Recreational use of the area in the Spring Mountains where these plants grow. Proposed MX system (indirectly).

REMARKS: The expanding population in southern Nevada will increase the impact on the plants in the Spring Mountains.

DRABA STENOLOBA var. RAMOSA



DRABA STENOLOBA Ledeb. var. RAMOSA C.L. Hitchc.
Carson Range Draba

FAMILY: Brassicaceae (Cruciferae) -- Mustard Family

CITATION AND HISTORY: *Draba stenoloba* var. *ramosa* C.L. Hitchcock, University of Washington Publications in Biology, 11:102. 1941. Synonym: *Draba nemorosa* var. *macrocarpa* Korshinsky (in part), as treated by Schulz, Pflanzenreich, IV:313. 1927. Type: Baker, about Marlette Lake, Washoe County, NV, 19 July 1902. The specific name, *ramosa*, refers to the branched stems of this variety.

DESCRIPTION: An annual, biennial, or perennial with a simple or branched rootstock and mostly basal leaves which are obovate to oblanceolate and 10 to 40 mm (0.4 to 1.6 in) long. The leaves are usually fine toothed and densely pubescent with simple or forked hairs. Each leaf axil gives rise to a branch.

The inflorescence bears 10 to 30 yellow to cream-colored flowers, with pubescent sepals about 1.5 mm long and spatulate petals about 3 mm long.

The capsules are linear to linear-oblong, 8 to 12 mm long, and pubescent with fine, short hairs.

From *Draba stenoloba* var. *nana* (O.E. Schulz) C.L. Hitchc. which occurs in the same general area, this variety can be separated by its abundant branching characteristic, capsules which are finely pubescent rather than smooth or pubescent with larger, stiff hairs, and individual capsule stalks which are generally longer than the capsules in the lower part of the inflorescence.

Flowering in June and July.

HABITAT: Moist granitic sand, or grassy rills near a stream. Associated plants: *Draba stenoloba* var. *nana*, *Polygonum kelloggii*, *Ranunculus alismaefolius*, and *Juncus* sp. Elevation: 2135-3050 m (7000-10,000 ft).

KNOWN DISTRIBUTION: Douglas and Washoe counties, Nevada. California.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: State of Nevada, USFS, and private.

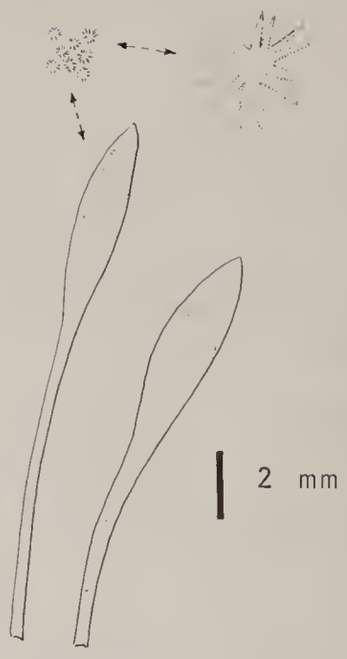
EXISTING OR POTENTIAL THREATS: None known.

REMARKS: Recent collections have extended the range of this inconspicuous *Draba*.

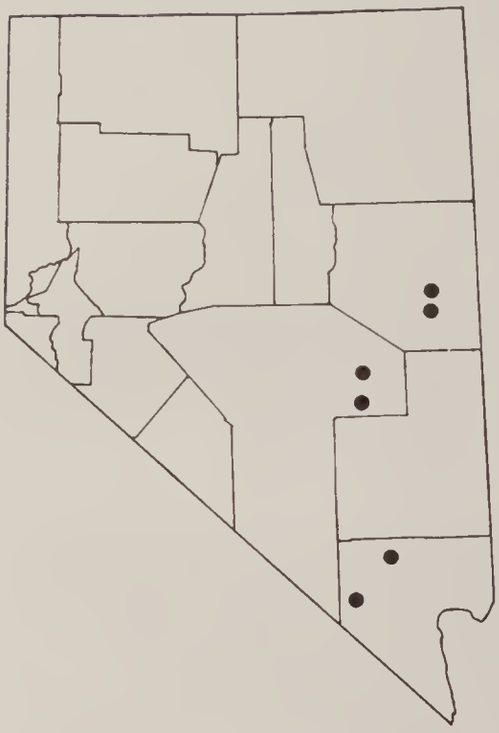
LESQUERELLA HITCHCOCKII

1 cm

1 cm



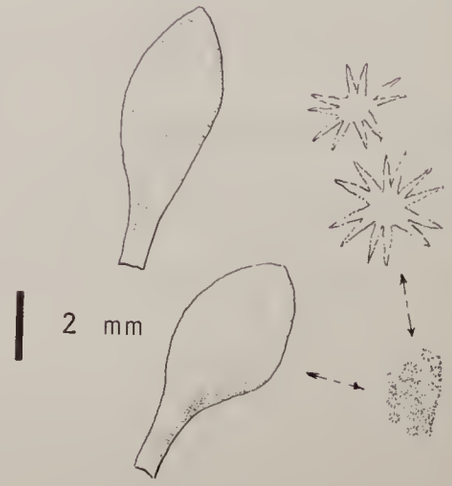
2 mm



Quinn Canyon Range

1 cm

1 cm



2 mm

0.2 mm

Spring Mountains

LESQUERELLA HITCHCOCKII Munz
Hitchcock Bladderpod

FAMILY: Brassicaceae (Cruciferae) -- Mustard Family

CITATION AND HISTORY: *Lesquerella hitchcockii* Munz, Bulletin of the Torrey Botanical Club, 56:163. 1929. Type: Jaeger and Hitchcock, Charleston (Spring) Mountains, Clark County, Nevada, 10,500 ft, 1 September 1927. Synonyms: *Lesquerella hitchcockii* ssp. *confluens* Maguire and Holmgren (for plants of the Quinn Canyon Range, Nye County, Nevada), Madroño, 11:172. 1951. *L. confluens* (Maguire and Holmgren) Reveal, Great Basin Naturalist, 30:96. 1970. Both the specific name, *hitchcockii*, and the common name honor C. Leo Hitchcock, one of the collectors of the type specimen.

DESCRIPTION: A small perennial pubescent with stellate hairs on both stems and leaves. The rootstock produces a number of unbranched stems 1 to 4 cm (0.4 to 1.6 in) long. The spatulate to oblanceolate leaves are 2 to 4 mm wide and 6 to 12 mm long.

The flowering stems are 1 to 1.5 cm (0.4 to 0.6 in) long and bear a few pale yellow flowers with petals 5 to 7 mm long. The fruit is a subglobose capsule which is reddish, smooth, and 3 to 4 mm long. The seeds number 2 to 4 in each half of the capsule.

A taxonomic problem exists with the two closely related, but geographically separate, forms of this taxon shown in the drawings. Plants from the Grant, Quinn Canyon, and Schell Creek ranges (which have been referred to *L. confluens*) differ in forming large mats, with leaves 10 to 24 mm (0.4 to 1 in) long and only 1 to 3 mm wide and styles 4 to 6 mm long compared to styles 3 to 4.5 mm in plants from the Sheep Range and the Spring Mountains. Rollins and Shaw (1973) do not recognize the subspecies.

Flowering from June to August.

HABITAT: Loose limestone, rocky, gravelly soil, talus slopes. Associated plants: *Pinus monophylla*, *P. ponderosa*, *P. longaeva*, *Abies concolor*, and *Artemisia nova*. Elevation: 2130-3510 m (7000-11,500 ft).

KNOWN DISTRIBUTION: Clark, Nye, and White Pine counties, Nevada.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFS and USFWS.

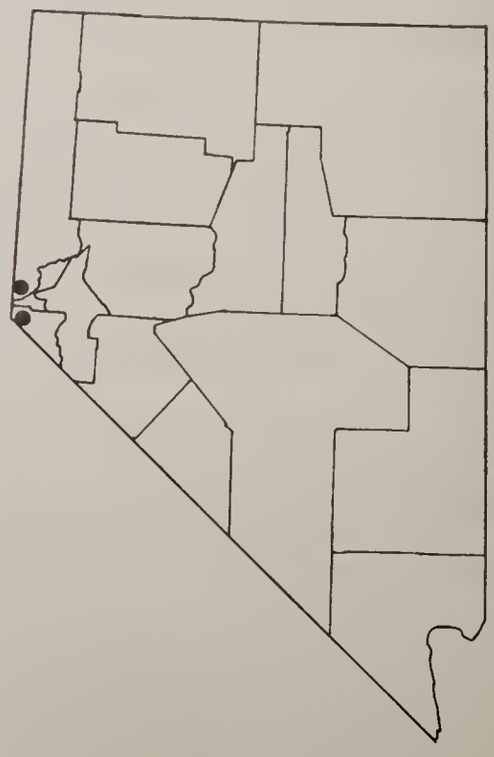
EXISTING OR POTENTIAL THREATS: Recreational use of the area where *Lesquerella hitchcockii* has been found in the Spring Mountains. Proposed MX system (indirectly).

REMARKS: These plants are widely distributed in remote areas so that at present there is no real threat to their survival regardless of whether they are considered to be a single taxon or two separate entities.

RORIPPA SUBUMBELLATA

1 cm

5 mm



RORIPPA SUBUMBELLATA Rollins
Tahoe Yellow-cress

FAMILY: Brassicaceae (Cruciferae) -- Mustard Family

CITATION AND HISTORY: *Rorippa subumbellata* Rollins, Contributions from the Dudley Herbarium, 3:177. 1941. Type: Heller, Meek's Bay, Lake Tahoe, El Dorado County, CA, 29 July 1919. The inflorescence in this species is relatively short, although still technically a raceme, and it appears, because of the cluster of flowers, to be somewhat umbellate, hence the specific name, *subumbellata*.

DESCRIPTION: A perennial herb with pubescent sprawling branches 5 to 15 cm (2 to 6 in) in length. The leaves vary from pubescent to smooth and are broadly oblanceolate or oblong and subpinnatifid.

The short, almost umbellate inflorescence bears yellow flowers with smooth to hairy sepals 2.3 to 2.8 mm long and somewhat spatulate petals 2.7 to 3.4 mm long.

The fruiting capsule varies from oblong to nearly globose and is from 3.5 to 5.5 mm long. The capsules may be either smooth or pubescent at maturity. The style is 0.7 to 1.5 mm long and has an unexpanded stigma.

The pubescent stems, petals longer than the sepals, prostrate habit and fleshy leaves under 3 cm long readily separate this mustard from any others likely to be found in the area. Although similar to *R. sinuata* (Nutt.) Hitchc., this latter species is readily separated by its larger leaves and flowers, hairless stems, linear-oblong capsules (7 to 14 mm long), as well as glabrous stems.

Flowering in June and July.

HABITAT: Sandy beach, close to the lake. Associated plants: *Juncus balticus*, *Phacelia hastata* var. *hastata*, *Carex douglasii*, *Potentilla glandulosa*, *Verbascum thapsus*, *Salix* sp., *Arnica* sp., and *Rumex* sp. Elevation: 1920 m (6300 ft).

KNOWN DISTRIBUTION: Douglas and Washoe counties, Nevada. El Dorado and Placer counties, California.

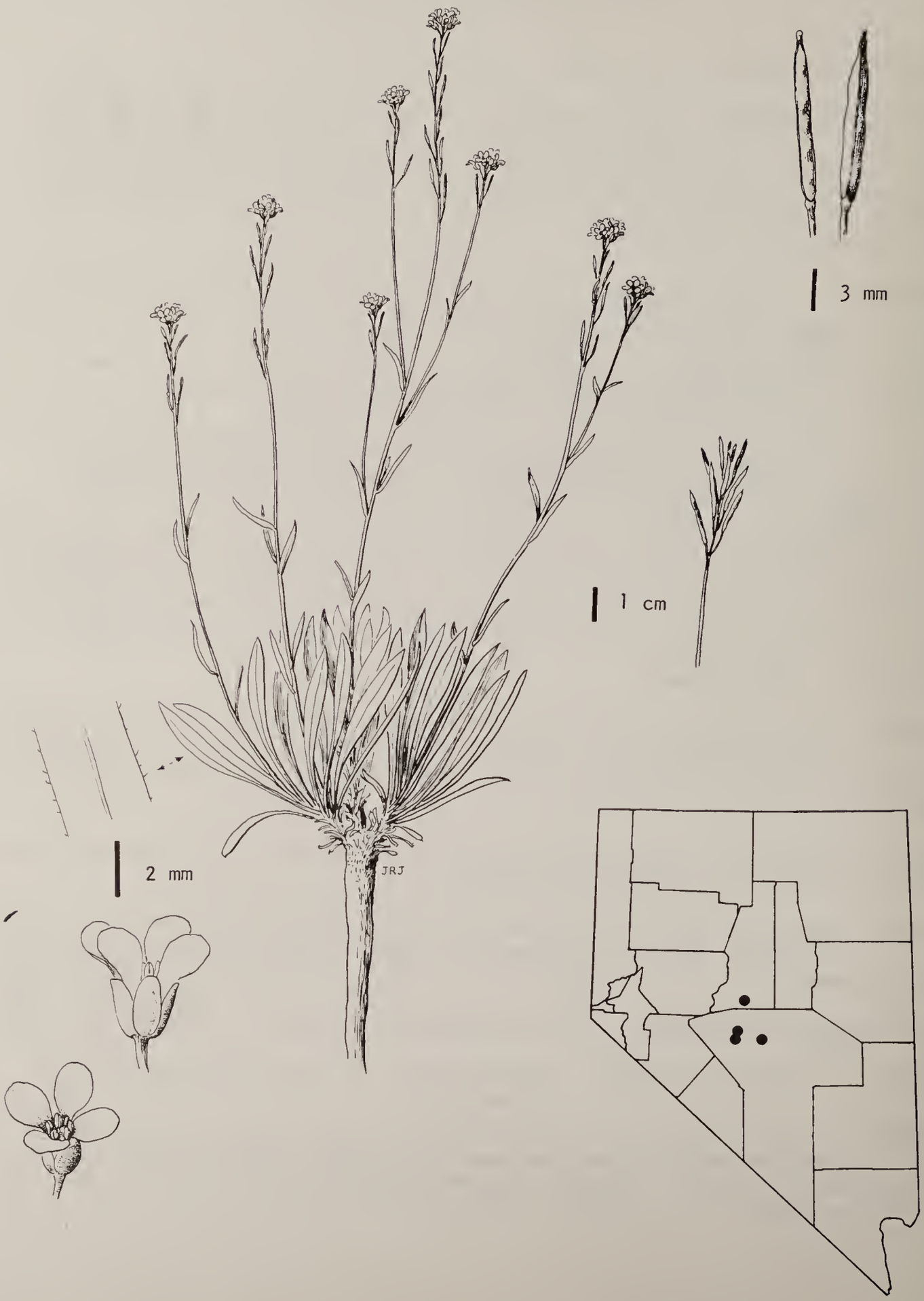
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 25 February 1978); endangered (Reno T/E Workshop, 2 November 1979); threatened (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: State of Nevada and private.

EXISTING OR POTENTIAL THREATS: Shifting sands and heavy recreational use of the beaches.

REMARKS: An intensive search of the beaches of Lake Tahoe has disclosed populations of this taxon not previously known, hence the threat to it is not nearly as great. However, the small population on State of Nevada land in Douglas County should be given protection.

SMELOWSKIA HOLMGRENII



SMELOWSKIA HOLMGRENII Rollins
Holmgren Smelowskia

FAMILY: Brassicaceae (Cruciferae) -- Mustard Family

CITATION AND HISTORY: *Smelowskia holmgrenii* Rollins, Contributions from the Gray Herbarium, 171:50. 1950. Type: A. Holmgren and C. Ballenger, Toquima Range, Nye Co., NV, 10,000 ft, 4 Aug 1947. This crucifer is named for Arthur H. Holmgren, one of the collectors of the type.

DESCRIPTION: A tufted perennial with a branching crown, each crown topped with a stiffly erect cluster of lanceolate to linear-lanceolate leaves 2 to 5 cm (0.8 to 2 in) long. The blade tapers gradually into the petiole and is hairless except for a few hairs along the margin. There are only several stem leaves and these are linear and 1 to 2 cm long.

The inflorescence bears white flowers with spatulate petals 3.5 to 4.5 mm long. Individual flower stalks are smooth and 3 to 8 mm long. The linear-oblong and purplish sepals are about 2 mm long.

The capsules are borne in erect fashion and are linear-oblong and tapering at both ends, and only slightly flattened. At maturity they are purplish and 5 to 12 mm long. The seeds are brown, wingless, and about 2 mm long.

Superficially, this species might be considered similar to some of the white-flowered *Arabis* species, but the stiff, erect and hairless leaves and capsules which are not flattened easily distinguish *S. holmgrenii*. Similarly, it can be readily separated from other rock inhabiting mustards such as *Draba* by these same characteristics, and notably by capsules which are narrow and long rather than three times or less longer than wide as is true of *Draba*.

Flowering from June to August.

HABITAT: Cliffs and talus of schist, crevices in calcareous rocks. Associated plants: *Heuchera rubescens, Leucopoa kingii, Holodiscus dumosus, Mertensia oblongifolia, Senecio canus, Erigeron compositus, Ribes cereum,* and *Selaginella watsonii*. Elevation: 1980-3350 m (6500-11,000 ft).

KNOWN DISTRIBUTION: Lander and Nye counties, Nevada.

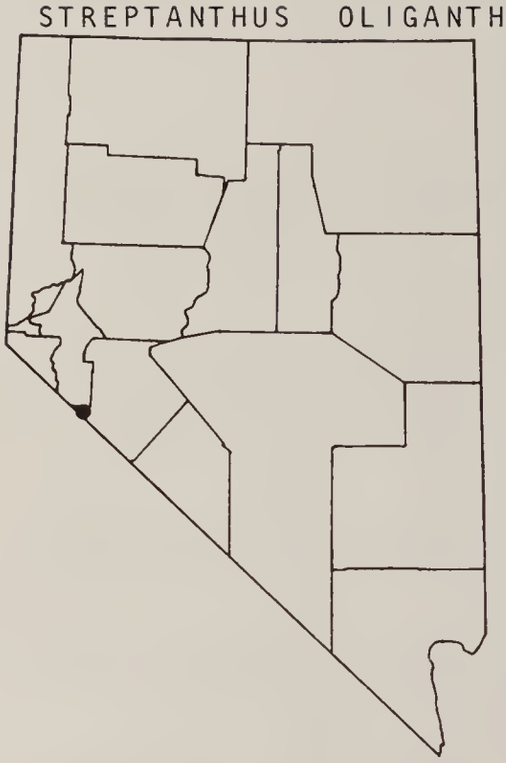
STATUS: Possibly extinct (1975 *FR*); endangered (1976 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

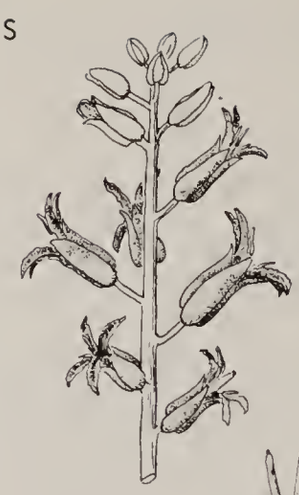
LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: None known.

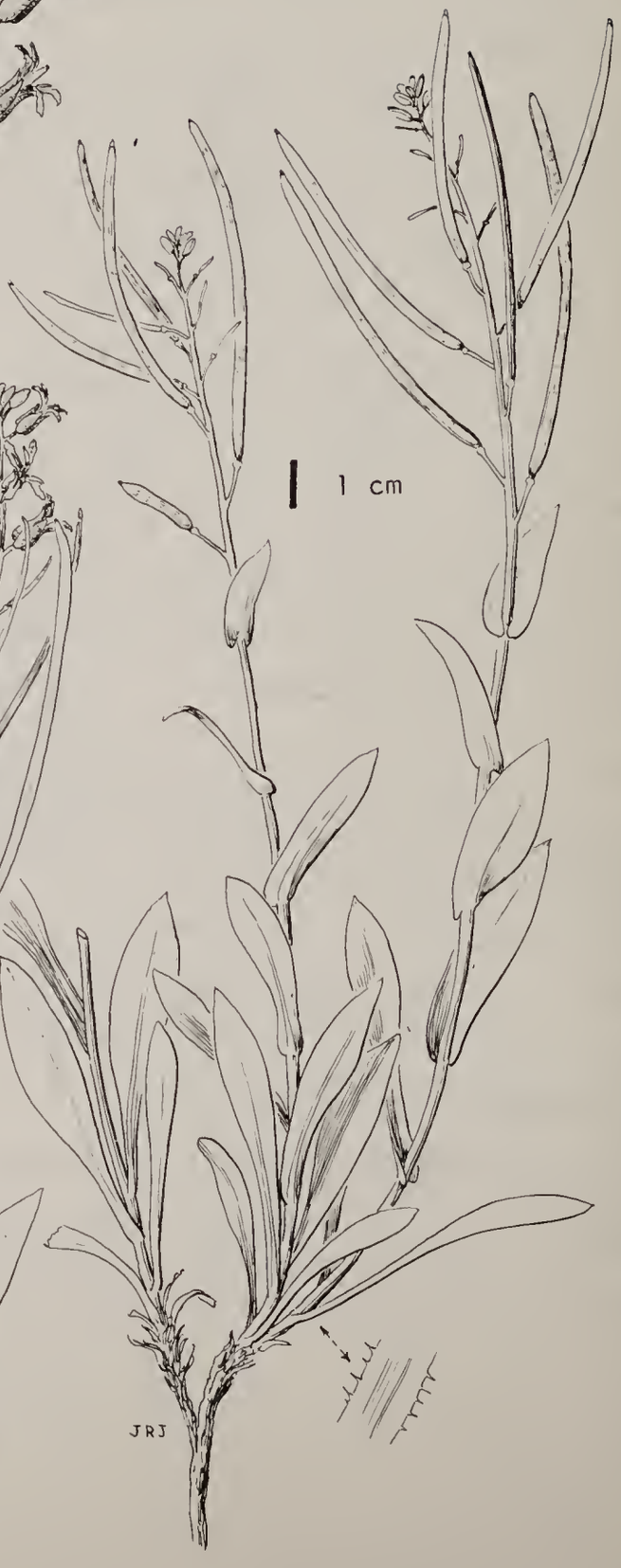
REMARKS: Extensive field work has found *Smelowskia holmgrenii* to be widely distributed within a limited area. Its habit of growing in rock crevices offers natural protection.

STREPTANTHUS OLIGANTHUS

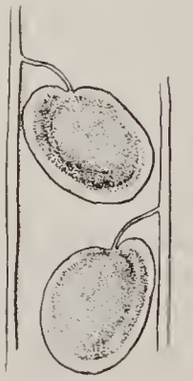




1 cm



1 cm



2 mm

JRJ

STREPTANTHUS OLIGANTHUS Rollins
Few Flowered Streptanthus

FAMILY: Brassicaceae (Cruciferae) -- Mustard Family

CITATION AND HISTORY: *Streptanthus oliganthus* Rollins, Contributions from the Dudley Herbarium, 3:372. 1946. Type: Wiggins and Rollins, NW of Masonic, Mono County, California, 8100 ft, 3 August 1945. The specific name, *oliganthus*, means few flowered.

DESCRIPTION: A perennial with one or a few stems from the base, usually unbranched. The leaves and stems are glaucous and lack any pubescence except for a few hairs along the petiole margin of the basal leaves. The basal leaves are lanceolate to oblanceolate and 4 to 8 cm (1.6 to 3.2 in) long. The stem leaves are smaller with the uppermost becoming sessile and sagittate.

The inflorescence is relatively few flowered with flowers bearing 1 to 1.5 cm long petals with purple tips and paler below. The sepals are oblong, purple, smooth, and 6 to 10 mm long.

The capsules are smooth, flattened, straight or nearly so, and 4 to 7 cm (1.6 to 2.8 in) long. The seeds are flat, circular, and winged, and about 2 mm broad.

The key diagnostic characters for this species are the essential lack of pubescence, perennial aspect, sagittate-clasping upper stem leaves, and relatively large purplish flowers. From the similar *S. cordatus* Nutt. which may be found in the same area, it may be separated by its slender stems which reach a height of 4 dm (16 in) while *S. cordatus* has stout stems which range from 3 to 8 dm (12 to 32 in) in height.

Flowering in June and July.

HABITAT: Rocky slopes, andesite soil; often in litter under trees. Associated plants: *Pinus monophylla, Juniperus osteosperma, Artemisia tridentata, Phoenicaulis cheiranthoides, Arabis* spp., and grasses. Elevation: 2135-2500 m (7000-8200 ft).

KNOWN DISTRIBUTION: Mineral County, Nevada. Mono County, California.

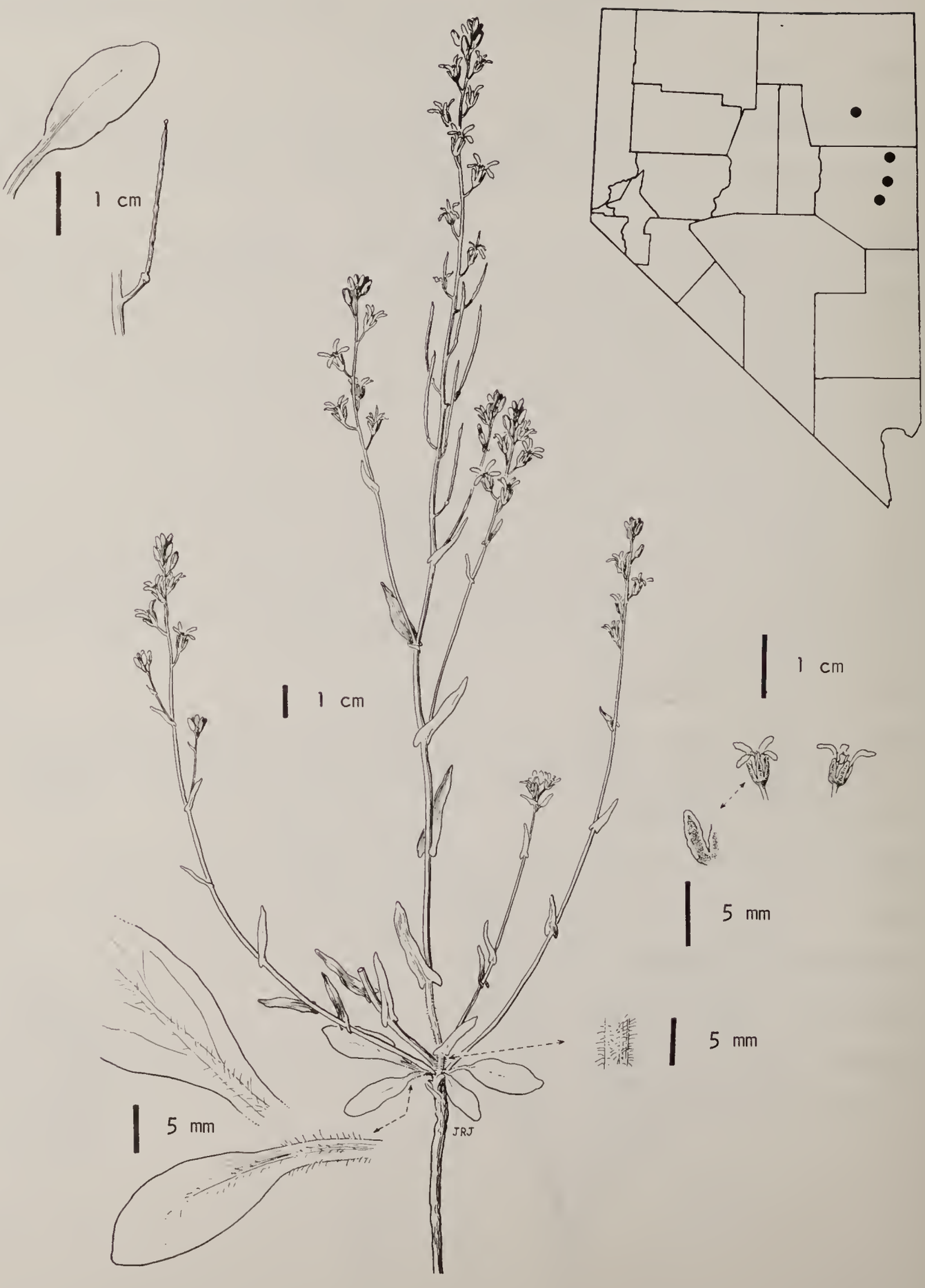
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Mining activity. Wood-cutting.

REMARKS: *Streptanthus oliganthus* is only known from a very small area in Nevada. Until more is known about its distribution and abundance, it is difficult to determine its status.

THELYPODIUM SAGITTATUM var. OVALIFOLIUM



THELYPODIUM SAGITTATUM (Nutt.) Endl. var. OVALIFOLIUM (Rydb.) Al-Shehbaz
Oval Leaf Thelypody

FAMILY: Brassicaceae (Cruciferae) -- Mustard Family

CITATION AND HISTORY: *Thelypodium sagittatum* var. *ovalifolium* (Rydb.) Al-Shehbaz, Contributions from the Gray Herbarium, 204: 121. 1973. Synonym: *Thelypodium ovalifolium* Rydberg, Bulletin of the Torrey Botanical Club, 30:253. 1903. Type: M.E. Jones, Panguitch Lake, Utah. 1894. Both the common name and the varietal name refer to the shape of the leaves.

DESCRIPTION: An herbaceous biennial with one or several stems from the base. The basal leaves are smooth or pubescent and ovate to oblanceolate or oblong in shape, and 2 to 20 cm (0.8 to 8 in) long. The stem leaves are smaller and clasping at the base.

The inflorescence is loosely flowered and has white to purplish flowers with petals 5 to 7.5 mm long. The sepals are 3 to 4.5 mm long.

The fruiting capsules are 1 to 3 cm (0.4 to 1.2 in) long.

This species can be separated from the other thelypodiums with clasping stem leaves likely to be found in the same area by petal and sepal lengths, supporting stalks of the individual fruits which are horizontal or ascending, and capsules which are generally erect.

Flowering from May to July.

HABITAT: Clay soils, by springs, streams, or lakes. Associated plants: *Elymus cinereus*, *Urtica holosericea*, *Solidago spectabilis*, *Arctium lappa*, *Smilacina stellata*, *Rosa woodsii* var. *ultramontana*, *Castilleja exilis*, *Salix* sp., and *Chrysothamnus viscidiflorus*. Elevation: 1830-2560 m (6000-8400 ft).

KNOWN DISTRIBUTION: Elko and White Pine counties, Nevada. Garfield and Iron counties, Utah.

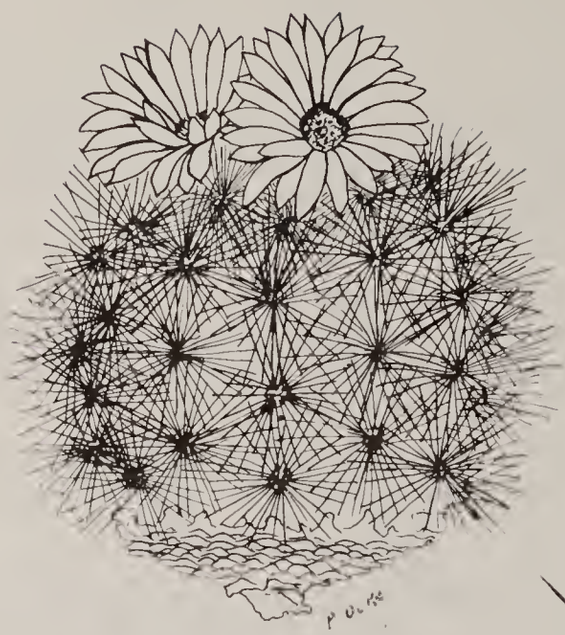
STATUS: Threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

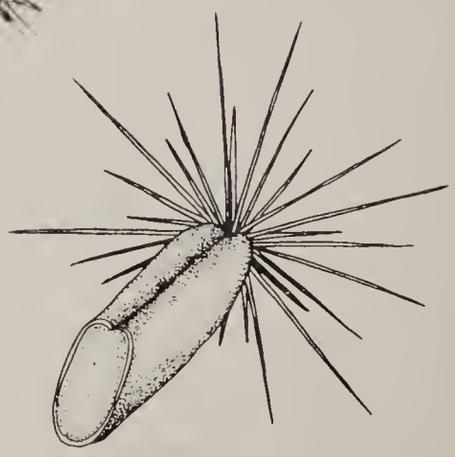
EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: This thelypody is not abundant at any of the sites where it has been found.

CORYPHANTHA VIVIPARA var. ROSEA



1 cm



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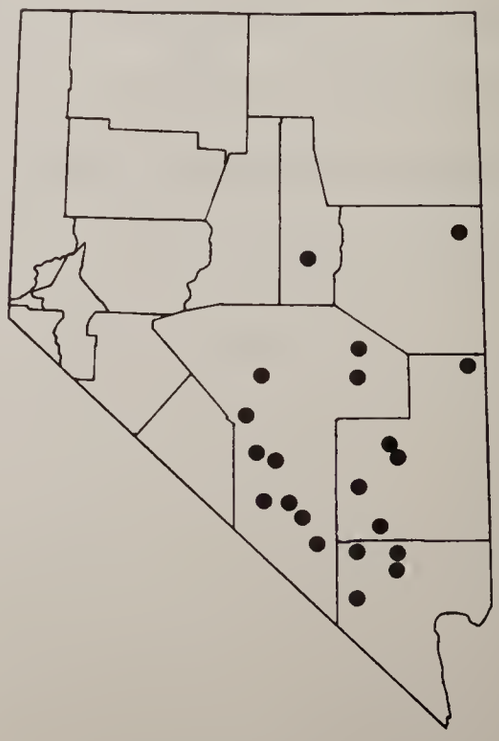


1 cm

CORYPHANTHA VIVIPARA (Nutt.) Britt. & Rose var. ROSEA (Clokey) L. Benson
Clokey Pincushion Cactus

FAMILY: Cactaceae -- Cactus Family

CITATION AND HISTORY: *Coryphantha vivipara* var. *rosea* (Clokey) L. Benson, Cacti of Arizona, 3:26. 1969. Synonym: *C. rosea* Clokey, Madroño, 7:75. 1943. Type: Clokey, Charleston (Spring) Mtns., Clark Co., NV, 2400 m. The varietal name, *rosea*, refers to the color of the flowers.

DESCRIPTION: A globular to ovoid cactus 4 to 15 cm (1.6 to 6 in) high. The dense spines hide the individual tubercles which are 10 to 15 mm (0.4 to 0.6 in) long and grooved along the upper side. The plants occasionally branch at the base.

The spines on each tubercle number 25 to 35, with the spines characteristically tipped with a brownish-red or darker color. The white radial spines are 16 to 25 mm (0.6 to 1 in) long. The 10 to 12 central spines are 19 to 25 mm long.

The pink to sometimes purplish flowers form a circle near the top of the plant and are 3 to 5 cm (1.2 to 2 in) wide when fully open. The reddish fruit is 2 to 2.5 cm (0.8 to 1 in) long.

The similar var. *arizonica* (Engelm.) W.T. Marshall can be separated by radial spines which number 20 to 30 compared to the 12 to 18 for var. *rosea*. Var. *alversonii* (Coulter) L. Benson also has pink flowers which are somewhat smaller than those of var. *rosea*. Also, the 8 to 10 central spines are shorter (1.3 to 1.6 cm) than those of var. *rosea*. Var. *desertii* (Engelm.) W.T. Marshall has yellow-green or pink flowers and only 4 to 6 short central spines; the 12 to 20 radial spines are less than half the thickness of those of var. *rosea*. *Pediocactus simpsonii* (Engelm.) Britt. & Rose, which grows in the same locale, has no groove on the upper side of each tubercle.

Flowering in June and July.

HABITAT: Gravelly limestone or volcanic slopes and brushy hillsides. Associated plants: *Pinus monophylla*, *Juniperus utahensis*, *Cerocarpus ledifolius*, *Artemisia nova*, *Coleogyne ramosissima*, *Ephedra nevadensis*, and *Cowania mexicana* var. *stansburiana*. Elevation: 1160-2740 m (3800-9000 ft).

KNOWN DISTRIBUTION: Clark, Eureka, Lincoln, Nye, and White Pine counties, Nevada. Arizona and California.

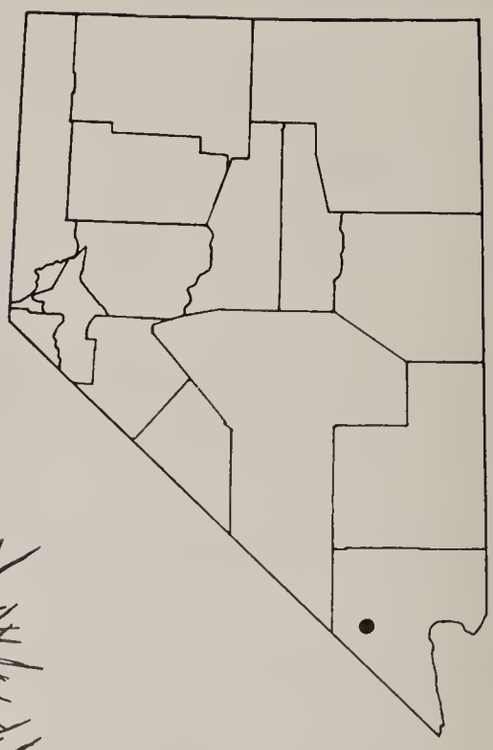
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

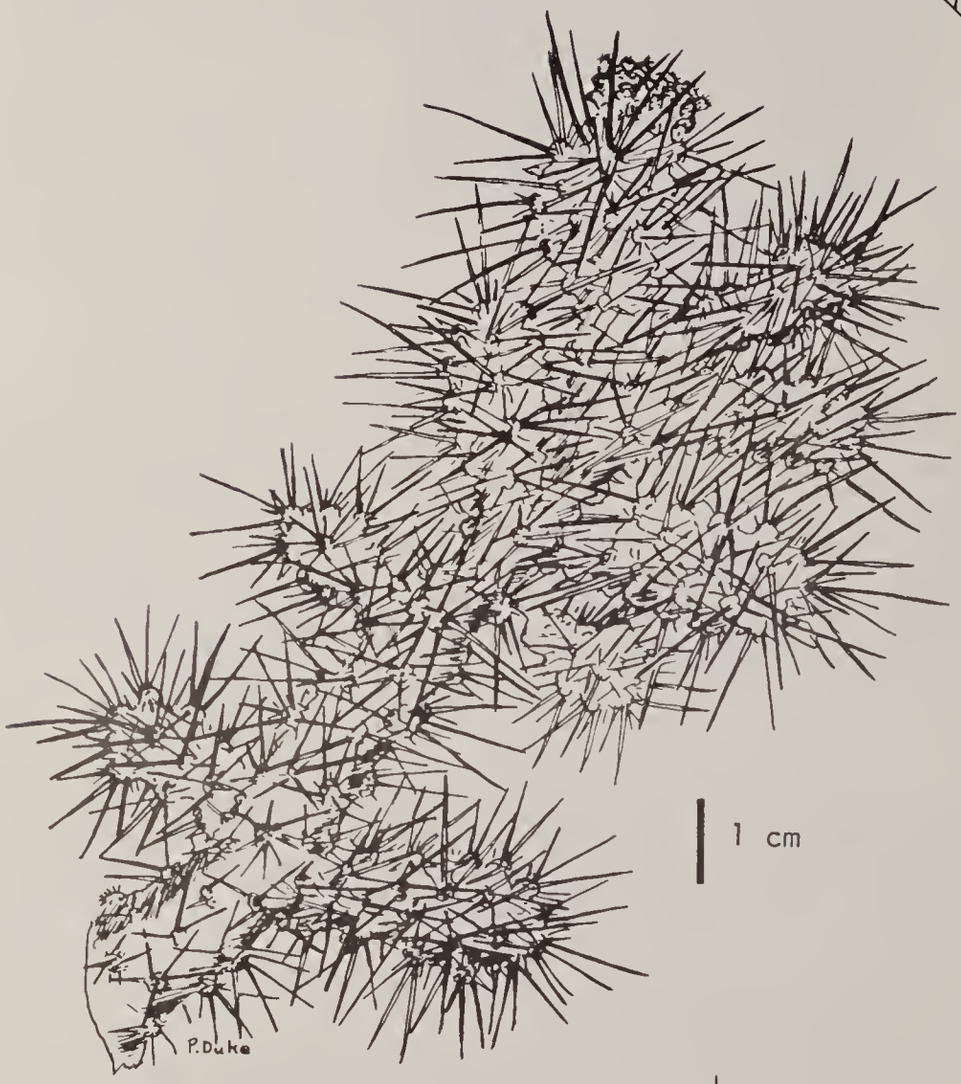
LAND OWNERSHIP/MANAGEMENT: BLM, DOD (Nellis AFB Bombing and Gunnery Range), DOE (Nevada Test Site and Tonopah Test Range), USFS, USFWS, and private.

EXISTING OR POTENTIAL THREATS: Commercial and private collectors. Off-road vehicles. Proposed MX system.

REMARKS: Although this cactus is widely distributed, it is not abundant at any one location. This cactus is prized by collectors.

OPUNTIA WHIPPLEI var. MULTIGENICULATA





OPUNTIA WHIPPLEI Engelm. & Bigelow var. MULTIGENICULATA (Clokey) L. Benson
Many Jointed Whipple Cholla

FAMILY: Cactaceae -- Cactus Family

ORIGINAL CITATION AND HISTORY: *Opuntia whipplei* var. *multigeniculata* (Clokey) L. Benson, Arizona Cactus, ed. 3:20, 38, 39. 1968. Synonyms: *Cylindropuntia abyssi* (Hester) Backeb. Cactac.: Handb. Kakteenk. i. 184. 1958. *C. multigeniculata* (Clokey) Backeb. l.c. 186. *O. abyssi* Hester, Cactus & Succ. Journ. (US), 15:193. 1943. *O. multigeniculata* Clokey, Madroño, 7:69. 1943. Type: Clokey, E of Wilson's ranch, Charleston (Spring) Mountains, Clark County, NV, 1400 m, 13 July 1939. The specific name: *multigeniculata*, means having many joints.

DESCRIPTION: A low cholla-type pricky pear generally less than 0.5 m (20 in) tall. The tubercles are closely placed on the crowded, 2 cm (0.8 in) thick lateral joints. Individual areoles are woolly with a tan color and have about 12 spines. The crowded spines from adjacent areoles nearly conceal the actual surface of the stems. The central spines on each areole are 1.5 to 1.8 cm (0.6 to 0.7 in) long. The glochids on each areole are white and about 1.5 mm long.

The greenish-yellow flowers are succeeded by the somewhat fleshy, spineless, yellow fruits.

This species somewhat resembles *Opuntia echinocarpa* Engelm. & Bigelow, but differs in that it has weaker, less woody and more crowded stems and has fleshy rather than dry fruits. Additionally, *O. echinocarpa* is not known to occur in the only locale in Nevada known for this cactus. From *O. whipplei* var. *whipplei* which also is not known from the area, it can be separated by its thicker, shorter, more crowded and thickly armed joints.

Flowering in May, in young fruit in July.

HABITAT: Open rocky or sandy ridges. Associated plants: *Larrea tridentata*, *Echinocereus engelmanii*, *Ferocactus acanthodes*, *Opuntia acanthocarpa*, and *O. erinacea*. Elevation: 1400-1425 m (4600-4675 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. Mohave County, Arizona.

STATUS: Threatened (1975 *FR)*; threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM.

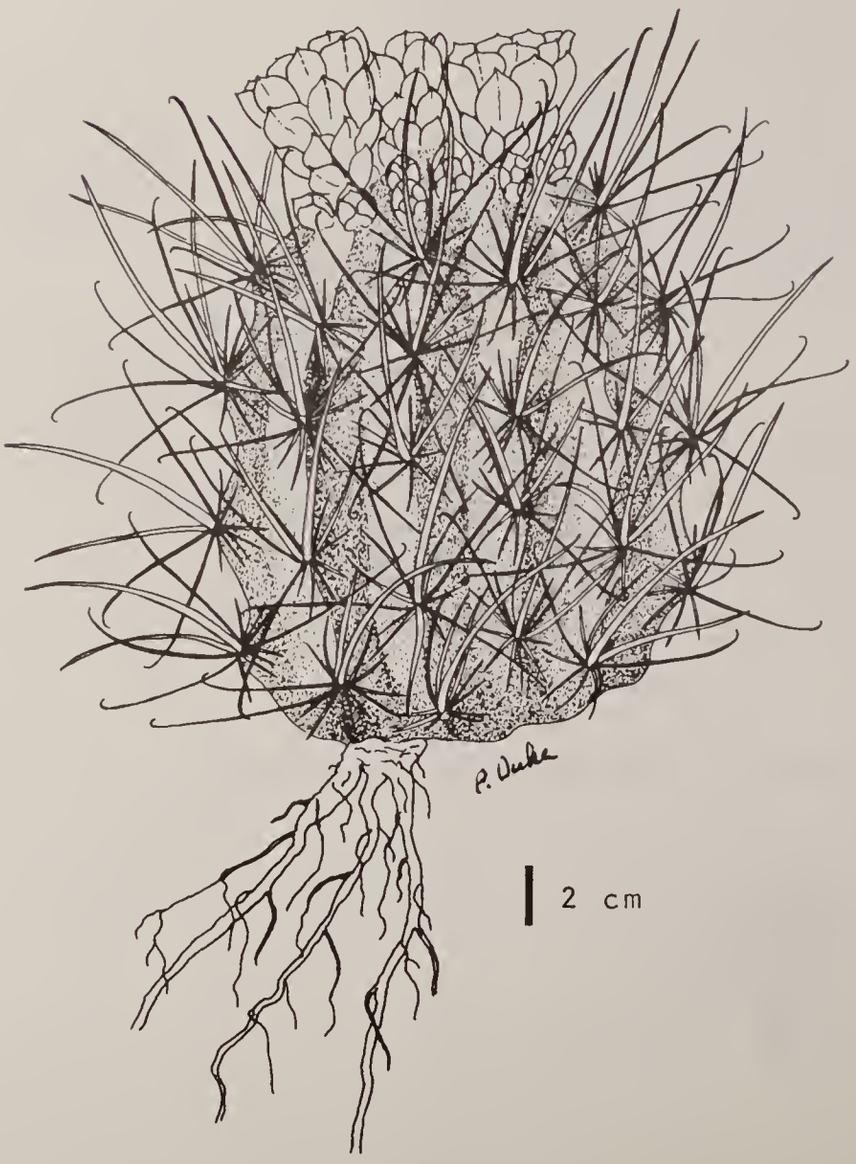
EXISTING OR POTENTIAL THREATS: Collecting for horticultural purposes.

REMARKS: Although this cactus has been found to be more abundant in Arizona than in Nevada, Mozingo and Williams feel that it should be retained as threatened. More field work needs to be done on the range of this taxon.

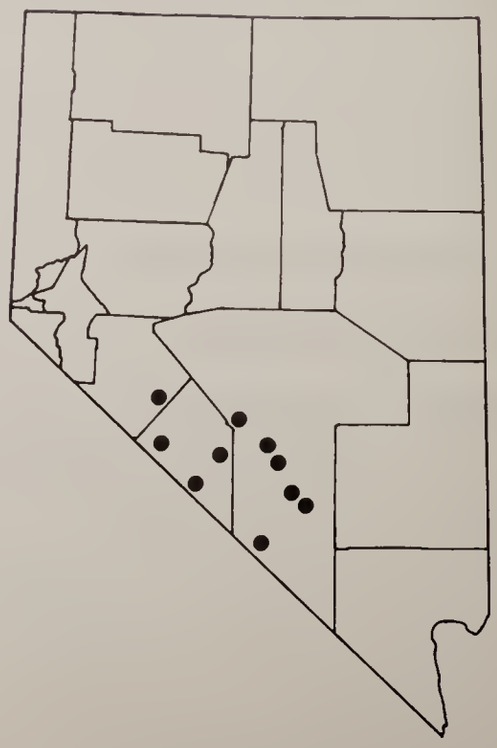
SCLEROCACTUS POLYANCISTRUS

1 cm

1 cm



2 cm



SCLEROCACTUS POLYANCISTRUS (Engelm. & Bigelow) Britton & Rose
Mojave Fishhook Cactus

FAMILY: Cactaceae -- Cactus Family

CITATION AND HISTORY: *Sclerocactus polyancistrus* (Engelm. & Bigelow) Britton & Rose, Cactaceae, 3:213. 1922. Synonym: *Echinocactus polyancistrus* Engelm. & Bigelow, Proceedings of the American Academy of Arts and Sciences, 3:272. 1856. Type: At the head of the Mojave River, eastern slope of the California mountains. The specific name, *polyancistrus*, meaning many fishhooks, refers to the spines.

DESCRIPTION: An erect globular to oblong cactus reaching a height of 4 dm (16 in), although generally much shorter. There are 13 to 17 strongly undulate ribs with the areoles 1 to 1.5 cm apart. Each of the latter bears about 20 spines with white radial ones 1 to 2.5 cm long and several central spines up to 12.5 cm (5 in) long. The upper central spines are white and flattened while the remainder are circular in cross section and are often hooked.

The purplish to red flowers are about 8 cm (3.2 in) long. The fruit initially is fleshy and bright magenta but eventually becomes dry, tan, and thin walled.

The long hooked spines on this species easily distinguish it from other similar sized small barrel cacti found in the same area, such as *Neolloydia johnsonii* (Parry) L. Benson. The much smaller, hooked-spine *Mammillaria tetrancistra* Engelm. has tubercles, rather than ribs, on which the spines are borne.

Flowering in May.

HABITAT: Desert flats, mesas, rocky slopes and knolls. Associated plants: *Atriplex confertifolia, Ceratoides lanata, Pinus monophylla, Juniperus osteosperma, Artemisia tridentata, Larrea tridentata,* and sometimes *Coryphantha vivipara* var. *rosea.* Elevation: 610-1920 m (2000-6300 ft).

KNOWN DISTRIBUTION: Esmeralda, Mineral, and Nye counties, Nevada. Arizona and California.

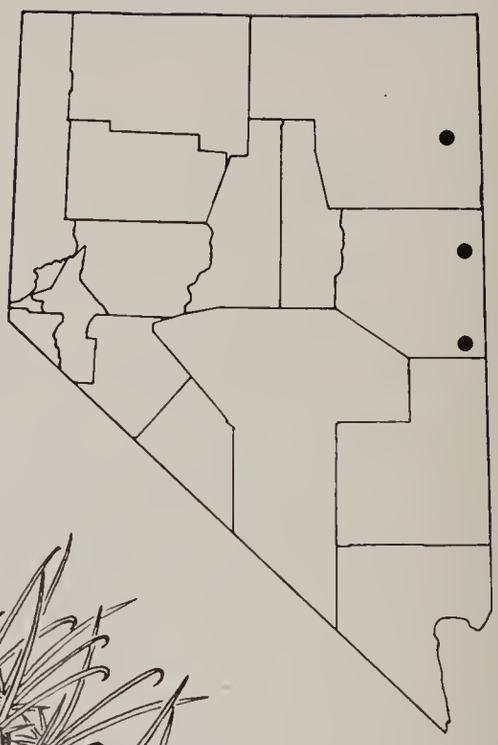
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

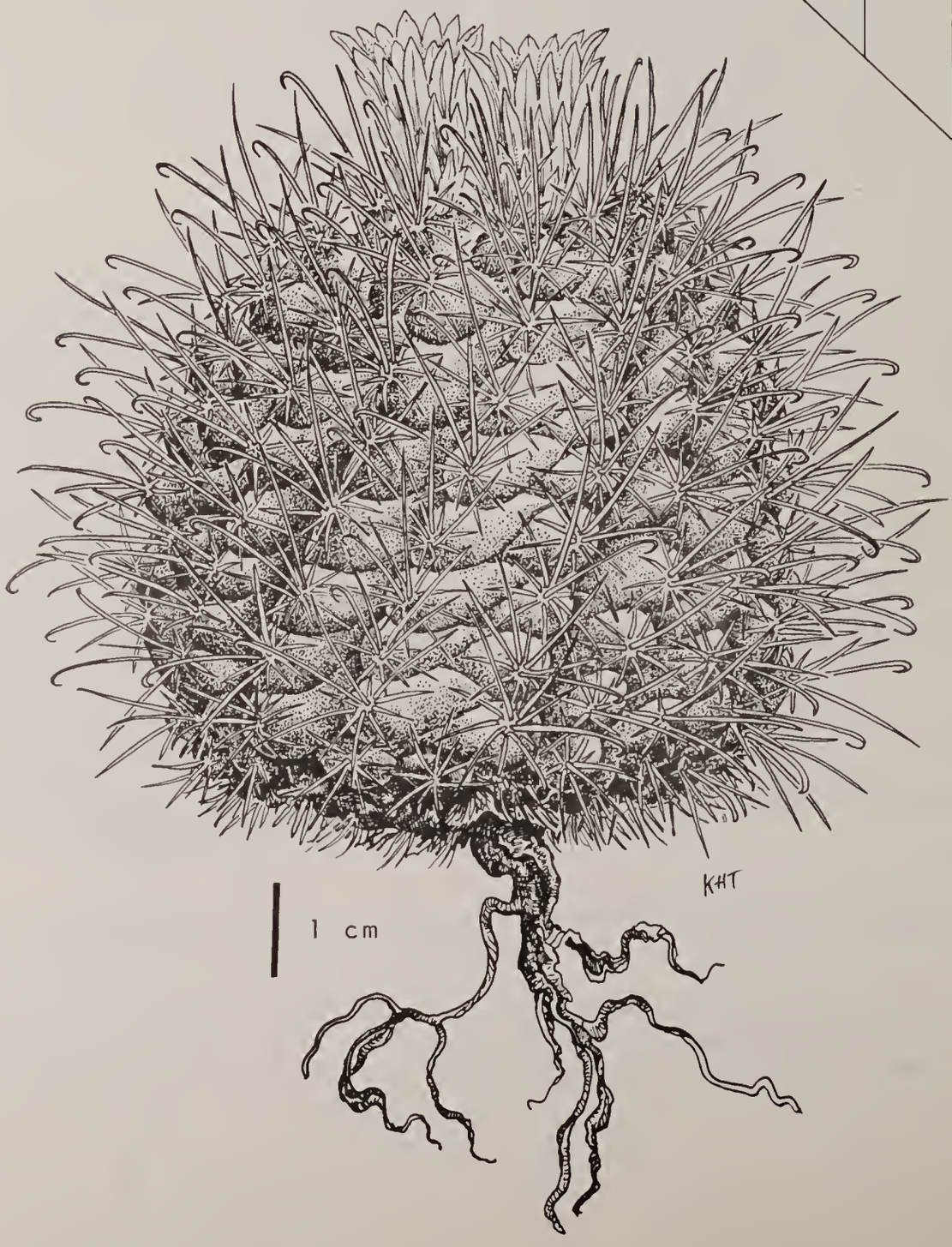
LAND OWNERSHIP/MANAGEMENT: BLM, DOD (Nellis AFB Bombing and Gunnery Range), DOE (Nevada Test Site and Tonopah Test Range), and private.

EXISTING OR POTENTIAL THREATS: Removal by commercial and private collectors. Off-road vehicles. Proposed MX system.

REMARKS: *Sclerocactus polyancistrus* is a very desirable cactus, but, unfortunately, seems to be very difficult to keep in cultivation. In the wild, plants are widely scattered with only a very few plants in any given area.

SCLEROCACTUS PUBISPINUS





SCLEROCACTUS PUBISPINUS (Engelm.) L. Benson
Great Basin Fishhook Cactus

FAMILY: Cactaceae -- Cactus Family

CITATION AND HISTORY: *Sclerocactus pubispinus* (Engelm.) L. Benson, Cactus and Succulent Journal (U.S.), 38:103. 1966. Synonyms: *Echinocactus pubispinus* Engelm., Trans. Acad. Sci. St. Louis, 2:199. 1863. *E. whipplei* var. *spinosior* Engelm., *l.c.*, 2:199. 1863. *Sclerocactus whipplei* (Engelm. & Bigel.) Britt. & Rose var. *spinosior* Engelm. ex Boissevain, Colorado Cacti, p. 51. 1940. *E. spinosior* (Engelm.) Brandegee ex Purpus, Kakteenk., 10: 119. 1900. Type: Pleasant Valley, near Salt Lake Desert, May. The specific name, *pubispinus*, describes the soft hairs on the spines.

DESCRIPTION: A small hemispherical cactus attaining 7.5 cm (3 in) in height and 6.2 cm (2.5 in) in diameter. The spines at the ends of the tubercles are densely pubescent in young plants, but glabrous in older examples.

The spines are nearly all white, with the bases of some brown. The lower central spine and sometimes one or two others are hooked. The long central hooked spine and two lateral centrals are noticeably flattened at the base with the hooked spine conspicuously longer than the others. The radial spines are white, number up to 8 per areole, with the longer ones reaching a length of 2.5 cm (1 in).

The reddish-purple flowers are about 2.5 cm (1 in) in length and diameter and produce a reddish fruit which is dry at maturity and about 9 mm (0.4 in) long.

There are no other hooked-spine cacti in the area of Nevada where *S. pubispinus* occurs, so that confusion with any other cactus is unlikely.

Flowering in May.

HABITAT: Rocky dolomite or quartzite soil. Associated plants: sagebrush-pinyon-juniper and *Atriplex* spp. Elevation: 1525-1830 m (5000-6000 ft).

KNOWN DISTRIBUTION: Elko and White Pine counties, Nevada. Utah.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Commercial or private collectors for horticultural purposes. Proposed MX system.

REMARKS: This cactus is not abundant in Nevada.

ARENARIA KINGII ssp. ROSEA

ARENARIA KINGII (S. Wats.) M.E. Jones ssp. ROSEA Maguire
Rosy King Sandwort

FAMILY: Caryophyllaceae -- Pink Family

CITATION AND HISTORY: *Arenaria kingii* ssp. *rosea* Maguire, Bulletin of the Torrey Botanical Club, 73:326. 1946. Type: Clokey, Charleston (Spring) Mountains, Clark County, Nevada, 2600 m, 4 August 1935. The rose-colored petals of the flowers give this plant its common name and the name of the subspecies, *rosea*.

DESCRIPTION: A few-flowered, few-stemmed perennial with a woody root-stock reaching a height of 1 to 2 dm (4 to 8 in). The few-leaved slender stems are glandular-pubescent. Most of the leaves are basal, 1 to 2 cm long and needle-shaped.

The pink flowers have sepals 3.6 to 4.5 mm long which are shorter than the petals. The sepals are glandular-pubescent and have a broad translucent margin.

Capsules 4.5 to 6.3 mm long are produced.

When in flower, this species is easily separated from any other arenaria likely to be found in the same area by means of its pink flowers. Additionally, it typically has fewer stems than the other subspecies of *A. kingii*. From the other narrow-leaved arenarias the species may be separated by its relatively broad, but pointed sepals, open inflorescence, and small stature. The similar *A. macradenia* S. Wats. differs in being twice as tall with sepals 4.5 to 6.0 mm long.

Flowering from June to early August.

HABITAT: Dry rocky hillsides, limestone ridges. Associated plants: *Pinus flexilis*, *P. ponderosa* var. *scopulorum*, *Penstemon keckii*, and *Townsendia jonesii* var. *tumulosa*. Elevation: 1800-2880 m (5905-9445 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, USFS, and possibly private.

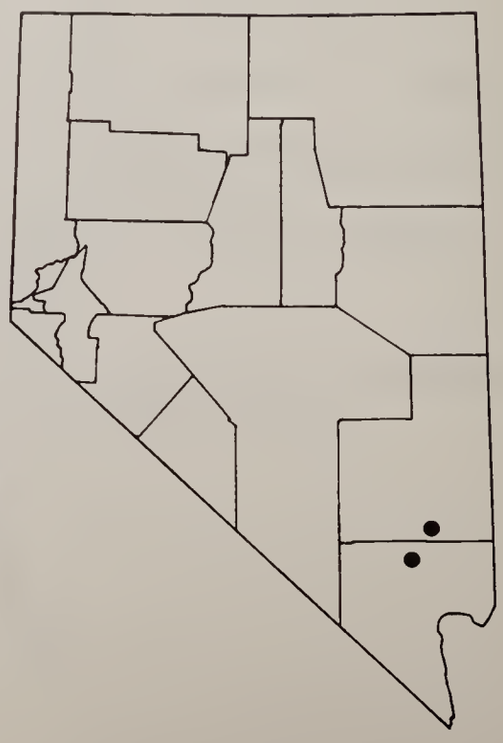
EXISTING OR POTENTIAL THREATS: Recreational use of the area where these plants grow. Proposed MX system (indirectly).

REMARKS: The expanding population in southern Nevada will increase the impact on plants in the Spring Mountains.

ARENARIA STENOMERES

1 cm

1 cm



ARENARIA STENOMERES Eastwood
Meadow Valley Range Sandwort

FAMILY: Caryophyllaceae -- Pink Family

CITATION AND HISTORY: *Arenaria stenomeres* Eastwood, Leaflets of Western Botany, 4:63. 1944. Type: Ripley and Barneby, south end of the Meadow Valley Range, Lincoln County, Nevada, 19 May 1944. The narrow petals and leaves are the character for the specific name, *stenomeres*.

DESCRIPTION: A densely clumped perennial 10 to 20 cm (4 to 8 in) tall with smooth stems and with the lower nodes each bearing three leaves. The very narrow, linear, hairless leaves are erect, 2 to 2.5 cm (0.8 to 1 in) long, rigid, and taper gradually to a sharp point. The base of the leaf is dilated.

The inflorescence is intermediate between a cyme and a panicle and bears small white flowers with narrow, linear petals about 1 mm wide which exceed the sepals in length by 2 or 3 mm. The sepals and pedicels are moderately to very stipitate glandular; the sepals are ovate with a tapered point and are longer than the mature capsules. The flowers have 10 stamens with threadlike stalks about 3 mm long.

The mature capsule is ovoid, obtuse, and about 4 mm long.

This species is distinguished from related forms primarily by the taper-pointed sepals, linear petals, and sepals which exceed the mature capsule in length.

Flowering in May.

HABITAT: Barren limestone cliffs and steep rocky slopes. Associated plants: *Lepidium fremontii* and *Sphaeralcea ambigua*. Elevation: 1005-1100 m (3300 3600 ft).

KNOWN DISTRIBUTION: Clark and Lincoln counties, Nevada.

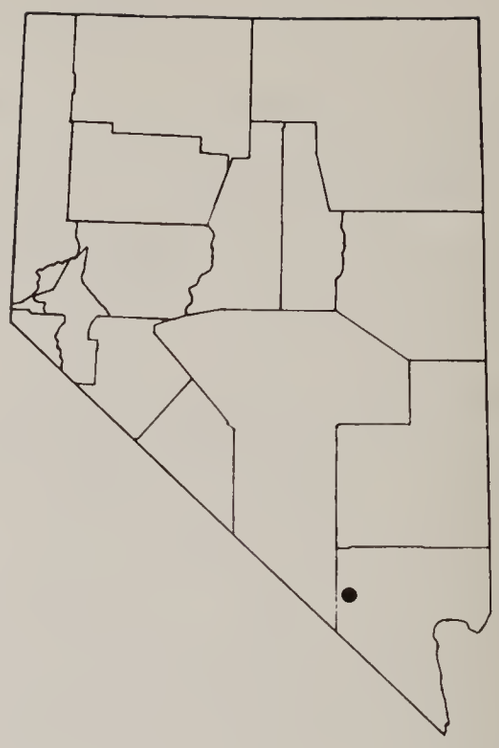
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP/MANAGEMENT: BLM and USFWS.

EXISTING OR POTENTIAL THREATS: Proposed MX system (indirectly).

REMARKS: This *Arenaria* has been rarely collected, however, it grows in very inaccessible areas. Other similar sites should be searched to determine the full range of this plant.

SILENE CLOKEYI



SILENE CLOKEYI C.L. Hitchc. & Maguire
Clokey Silene

FAMILY: Caryophyllaceae -- Pink Family

CITATION AND HISTORY: *Silene clokeyi* C.L. Hitchc. & Maguire, University of Washington Publications in Biology, 13:38. 1947. Type: Clokey, Charleston Peak, Clark Co., NV, 3400 m, 23 July 1937. This species was named for Ira W. Clokey, the collector of the type specimen.

DESCRIPTION: A perennial which develops several rhizomes from a taproot, each rhizome producing one or more 5 to 12 cm (2 to 4.8 in) tall stems which are sparsely to moderately pubescent. The basal leaves are narrowly oblanceolate while the stem leaves are linear-oblong to lanceolate and 1 to 2.5 cm long, and hairless to glandular, fine pubescent.

The flowering stems bear mostly a single flower which assumes a nodding position when the flower opens. The calyx is 12 to 15 mm long, somewhat inflated, with 10 green nerves. The pink to rose-purple corolla consists of petals with a narrow basal portion included within the calyx and an expanded upper blade 5 to 8 mm long which is bilobed for one-third to nearly all of its length.

This species resembles the common *Silene sargentii* S. Wats., but the latter species differs in its harsher pubescence, narrower stem leaves (1 to 2 mm compared to 2 to 4 mm), dried basal leaf petioles adhering for several years, a calyx which is only sparsely, not densely, glandular, and bilobed petal blades only 2.5 to 3.5 mm long.

Flowering in July.

HABITAT: Among limestone rocks at timberline. Associated plants: *Antennaria soliceps*, *Erigeron clokeyi*, *Lesquerella hitchcockii*, *Draba jaegeri*, *Ribes montigenum*, and *Sphaeromeria compacta*. Elevation: 3400-3520 m (11,150-11,550 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

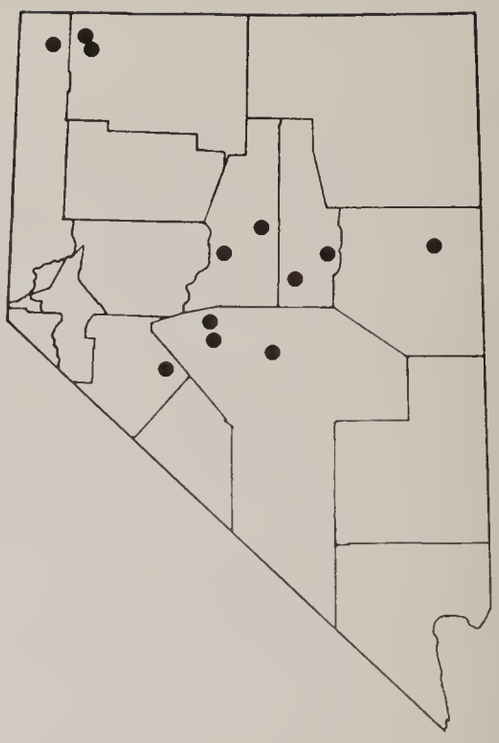
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

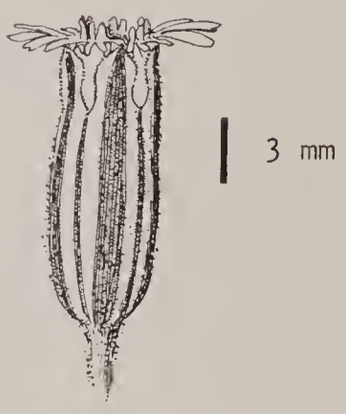
LAND OWNERSHIP/MANAGEMENT: USFS.

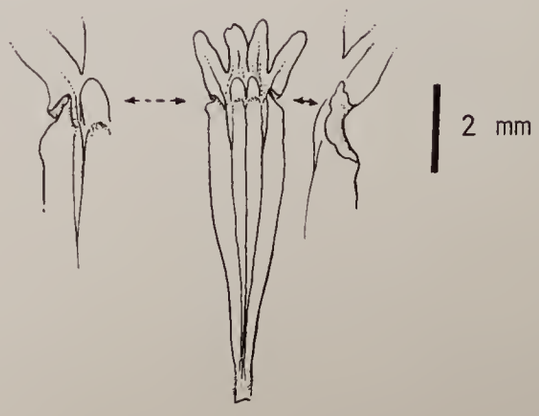
EXISTING OR POTENTIAL THREATS: Free roaming horses. Foot-traffic on unstable slopes. Proposed MX system (indirectly).

REMARKS: *Silene clokeyi* is apparently one of the rarest of the high elevation endemics in the Spring Mountains. The increasing population in southern Nevada will increase the impact on the plants in this recreational area.

SILENE SCAPOSA var. LOBATA







SILENE SCAPOSA Robins. var. LOBATA Hitchc. & Maguire
Lobed Petal Silene

FAMILY: Caryophyllaceae -- Pink Family

CITATION AND HISTORY: *Silene scaposa* var. *lobata* Hitchc. & Maguire, University of Washington Publications in Biology, 13:31. 1947. Type: Macbride and Payson, Blaine County, Idaho, 10 July 1916. The varietal name, *lobata*, and the common name both refer to the deeply lobed petals of the flowers.

DESCRIPTION: A tufted perennial with many finely and densely pubescent leaves and several stems which may reach 5 dm (20 in) in height. The leaves are oblanceolate or narrowly lanceolate and 2 to 12 cm (0.8 to 4.8 in) long. The stem leaves are reduced to one or two pairs of greatly reduced linear structures.

The finely pubescent, glandular inflorescence is elongated and narrow and supports many purplish or white flowers. The petals are narrow at the base and much expanded above and 7 to 11 mm (0.3 to 0.4 in) long. The upper portion or blade is about 3 mm long and deeply divided into four nearly equal oblong lobes. Individual flower stalks vary from 5 to 45 mm (0.2 to 1.8 in) long and support a calyx which is about 1 cm long, and possesses 10 evident green nerves. The stamen filaments are pubescent and much expanded at the base.

This *Silene* is easily separated from other *Silene* or *Lychnis* species which might be found in the same area by the nearly leafless flowering stems, characteristic widened, four-lobed petals, and pubescent stamen filaments.

Flowering in June and July.

HABITAT: Gravelly meadows and rocky hillsides. Associated plants: *Pinus monophylla, Juniperus osteosperma, Cercocarpus ledifolius,* and *Artemsia* sp. Elevation: 1710-2900 m (5600-9500 ft).

KNOWN DISTRIBUTION: Eureka, Humboldt, Lander, Mineral, Nye, Washoe, and White Pine counties, Nevada. Idaho and Oregon.

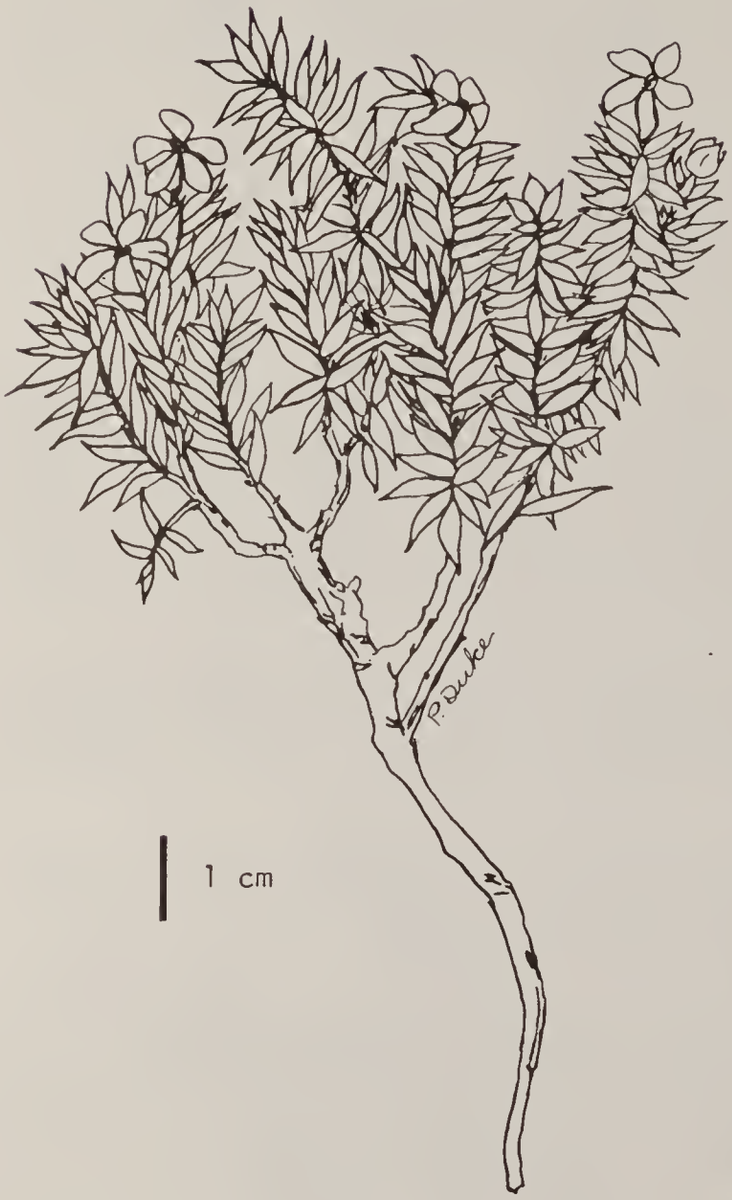
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

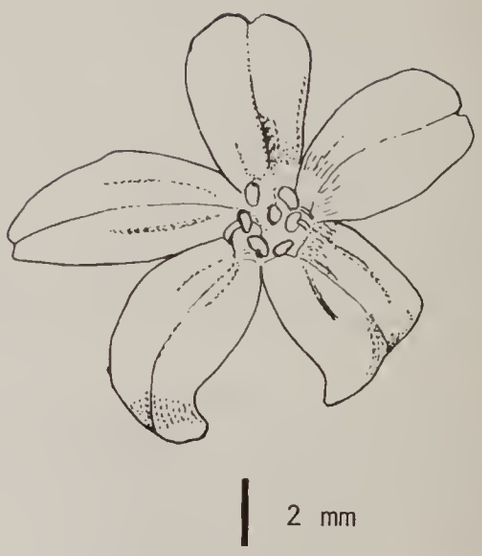
LAND OWNERSHIP/MANAGEMENT: BLM, USFS, and USFWS.

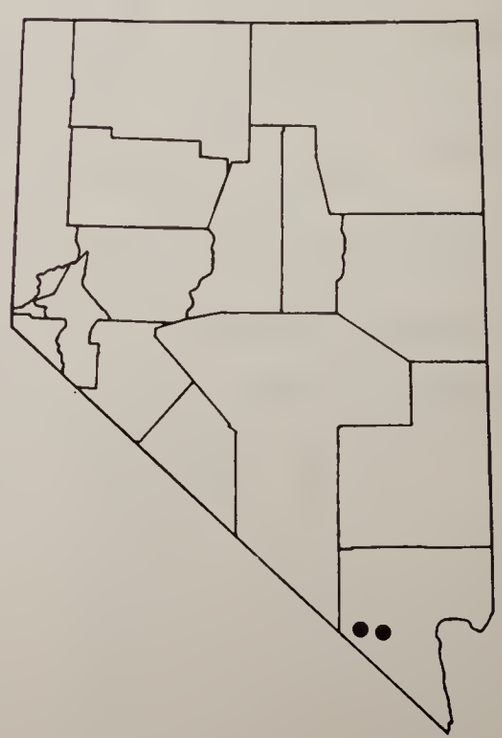
EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: None.

FORSELLESIA PUNGENS var. GLABRA







FORSELLESIA PUNGENS (Bdg.) Heller var. GLABRA Ensign
Low Grease-bush

FAMILY: Crossosomataceae -- Crossosoma Family

CITATION AND HISTORY: *Forsellesia pungens* var. *glabra* Ensign, The American Midland Naturalist, 27(2):503. 1942. Type: Jaeger, Clark Mountains, San Bernardino County, CA, 22 June 1930. The specific name, *pungens*, refers to the hard sharp point which terminates each leaf.

DESCRIPTION: A clumped, shrubby plant with stems 8 to 9 cm (3.2 to 3.6 in) tall. The oblong-elliptical leaves are 7 to 8 mm long, crowded on the branches, glabrous, and tapering at each end. The leaf is tipped with a short (1 mm) spine.

The flowers terminate the stems or short lateral branchlets on pedicels that are 3 to 4 mm long. The calyx consists of 5 broad, 4 mm long bracts with toothed margins. There are five obovate-lanceolate petals averaging 7 to 8 mm in length.

There are 2 or 3 pubescent carpels which develop into a firm, leathery seed pod which opens along one side to release the single seed.

Our other species of *Forsellesia* are spiny, *F. pungens* is not. *F. pungens* var. *pungens* differs in having scabrous-pubescent stems and leaves.

Flowering in May and June.

HABITAT: Vertical cliffs; limestone. Associated plants: sagebrush-pinyon-juniper and grasses. Elevation: 1220-1980 m (4000-6500 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. San Bernardino County, CA.

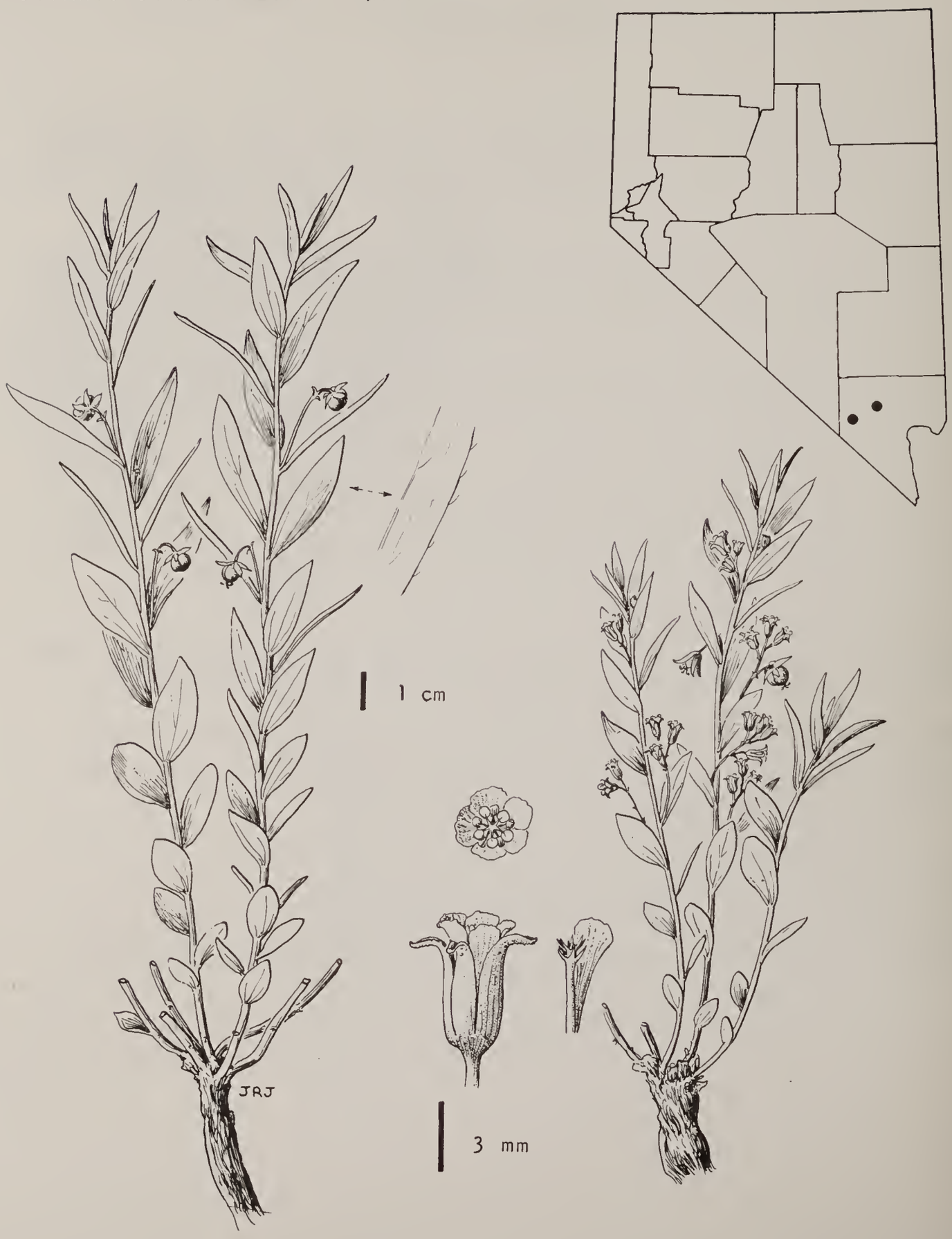
STATUS: Threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: Very little is known about this taxon in Nevada, it should be searched for.

DITAXIS DIVERSIFLORA (ARGYTHAMNIA CYANOPHYLLA)



DITAXIS DIVERSIFLORA Clokey
(ARGYTHAMNIA CYANOPHYLLA [Woot. & Standl.] J. Ingram)
Silverbush

FAMILY: Euphorbiaceae -- Spurge Family

CITATION AND HISTORY: *Ditaxis diversiflora* Clokey, Southern California Academy of Sciences Bulletin, 37:6. 1938. Synonyms: *Ditaxis cyanophylla* Wooton & Standley, Bulletin of the Torrey Botanical Club, 36:106. 1909. *Argythamnia cyanophylla* (Woot. & Standl.) J. Ingram, Bulletin of the Torrey Botanical Club, 80:423. 1953. Type: Clokey, Charleston Park, Charleston (Spring) Mountains, Clark County, Nevada, 2280 m, 24 May 1937. The common name, silverbush, is a translation of the name of the genus, *Argythamnia*.

DESCRIPTION: A many stemmed perennial with smooth, but dull stems which tend to become red or blue-green striped on drying. The prominently veined sessile leaves have only a few marginal hairs near the base and are about 5 mm long.

The staminate and pistillate flowers are separate on the same plant, with the staminate flowers having petals which are white, tinged with red or light yellow. The petals as well as the granular sepals are about 5 mm long. There are 10 stamens with red filaments fused into a tube. The pistillate flowers are similar, however, with slightly smaller petals which are rarely tinged with red. The ovary has a few appressed hairs and dries to blue color.

Formerly, *Ditaxis diversiflora* was separated on the basis of minor differences in flower color, seed characteristics, and sepal shape among other things. There is no valid basis for separating *D. diversiflora* from *D. cyanophylla*. The most recent revision classifies *Ditaxis* as belonging to the genus *Argythamnia*. The other members of the genus, except one, likely to be found in the same area are pubescent, while the one smooth species, *Argythamnia californica* Brandegee has much larger leaves that are petioled.

Flowering in May and June.

HABITAT: Brushy, south facing slopes. Associated plants: *Pinus ponderosa*, *Quercus gambelii*, *Cercocarpus ledifolius*, and *Euphorbia robusta*.

KNOWN DISTRIBUTION: Clark County, Nevada. Arizona and New Mexico.

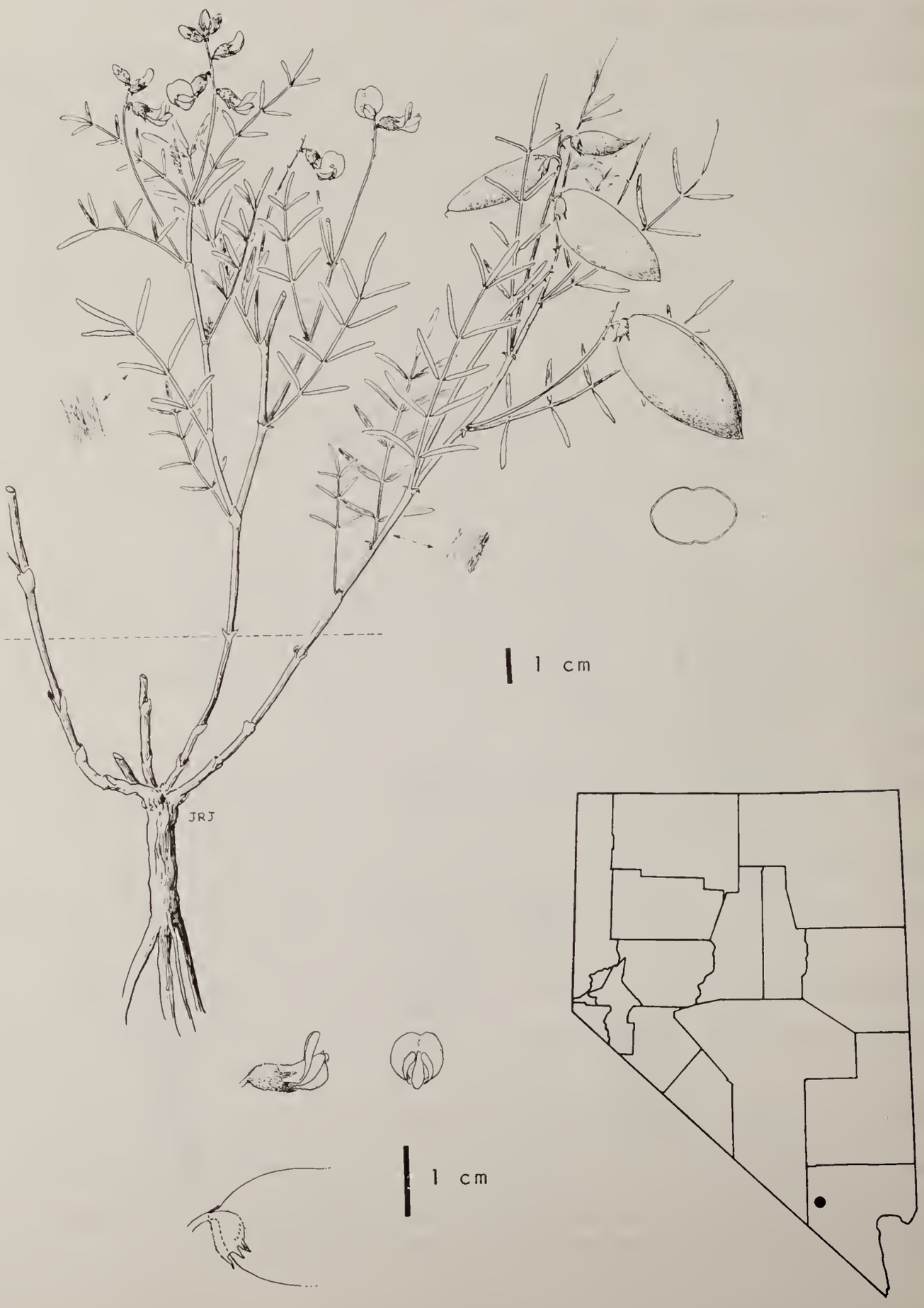
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); deleted (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFWS, private, and possibly USFS.

EXISTING OR POTENTIAL THREATS: Heavy recreational use of the habitat in the Spring Mountains. Proposed MX system (indirectly).

REMARKS: This taxon was believed to be endemic to the Spring Mountains, but recently it has been found in the Desert National Wildlife Range. Because it is considered to be synonymous with *Argythamnia cyanophylla* which has a wide distribution, it was deleted at the latest T/E Workshop. It is believed that this taxon has been extirpated from the Kyle Canyon area. It should be searched for in other parts of the Spring Mountains.

ASTRAGALUS AEQUALIS



ASTRAGALUS AEQUALIS Clokey
Clokey Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus aequalis* Clokey, Madroño, 6:215. 1942. Type: Clokey, Charleston (Spring) Mountains, Clark County, Nevada, 2200 m, 4 June 1937. The specific name, *aequalis*, means equal, referring to the pod's subsymmetrically convex edges.

DESCRIPTION: An erect perennial which attains a height of 70 cm (28 in), with stems marked with fine longitudinal lines and clothed with stiff, appressed, straight hairs. The leaves are 6 to 12 cm (2.4 to 4.8 in) long, with usually 11 leaflets that are narrowly lanceolate linear to linear. The leaflets are blunt-tipped and clothed with hairs similar to those on the stem. The stipules at the petiole base are narrowly triangular and average about 2 to 3 mm in length.

The simple, elongate inflorescence extends above the leaves and bears from 6 to 12 yellow flowers, which are individually about 1 cm long. The calyx tube is 4 to 4.5 mm long and the awl-shaped or narrowly triangular calyx teeth are only about one-third to one-fourth the length of the calyx tube. The upper petal is about 12 mm (0.5 in) long and ovate or subcircular in shape. The lateral petals are slightly shorter.

The fruiting pods are sessile, considerably inflated and from 3.5 to 4 cm (1.4 to 1.6 in long). The ripe pods are straw-colored to brownish and may be speckled with purplish brown on the side exposed to the sun. The top and bottom faces of the pods are equally convex, and the pods carry the calyces with them when they are shed.

Flowering in May and June.

HABITAT: Dry gravelly hillsides and open ridges, limestone. Associated plants: *Juniperus utahensis*, *Cercocarpus ledifolius*, *Pinus monophylla*, and *P. ponderosa* var. *scopulorum*; this *Astragalus* often shelters under low *Artemisia*. Elevation: 1800-2560 m (5905-8400 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

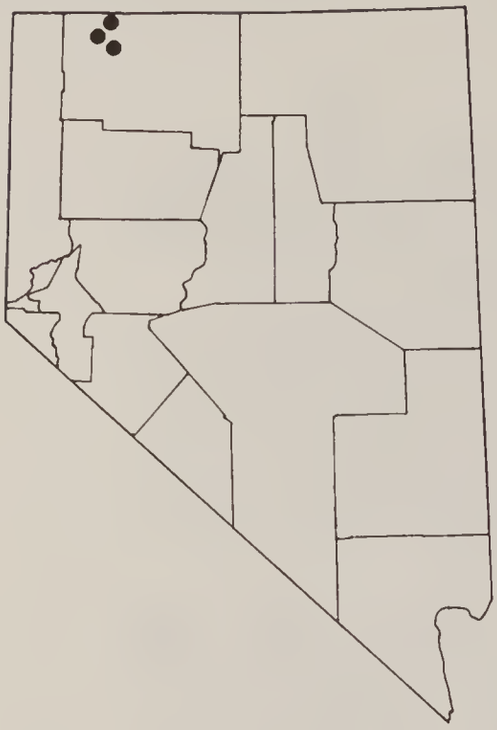
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

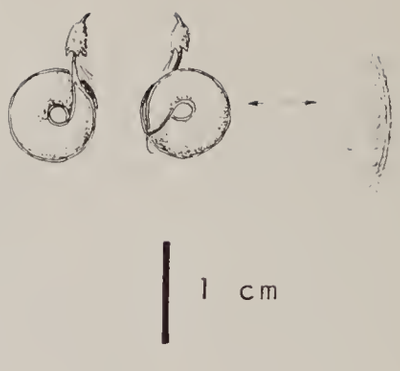
LAND OWNERSHIP/MANAGEMENT: BLM, USFS, and private.

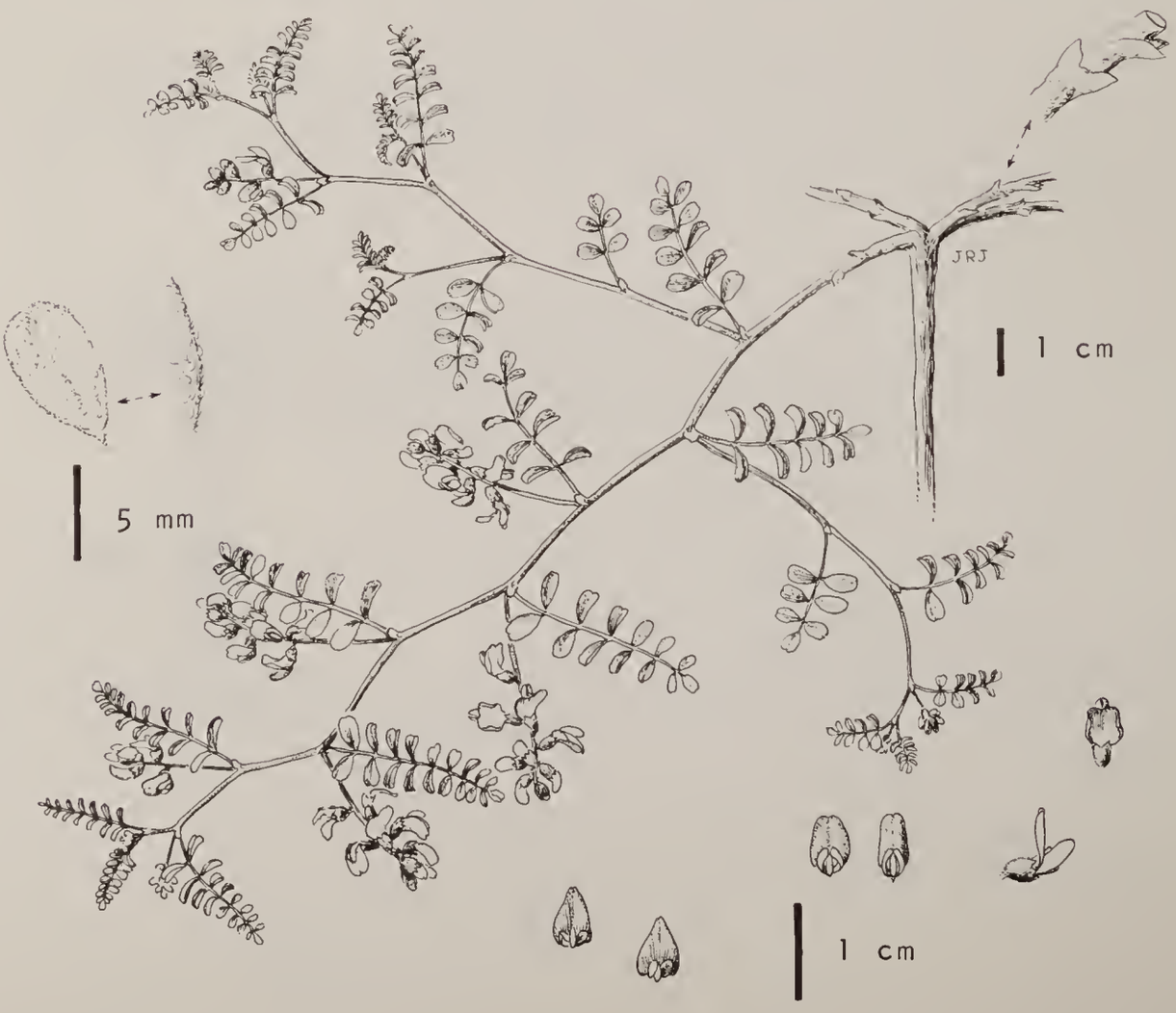
EXISTING OR POTENTIAL THREATS: Increased visitor use in recreation areas where this taxon is found. Proposed MX system (indirectly).

REMARKS: A search should be made to determine the full distribution of *Astragalus aequalis*.

ASTRAGALUS ALVORDENSIS







ASTRAGALUS ALVORDENSIS Jones
Alvord Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus alvordensis* Jones, Contributions to Western Botany, 10:67. 1902. Type: Cusick, Alvord Valley, Oregon, 18 June 1901. Both the common name and the specific name, *alvordensis*, come from the type location.

DESCRIPTION: A perennial with very slender and ascending, grayish stems to 30 cm (12 in) long. The stems and leaves are pubescent with twisted, short hairs from 0.2 to 0.5 mm long. The compound leaves are composed of 11 to 21 narrow to broad leaflets with a notch at the rounded apex of each leaflet. The lowermost stipules are papery in texture and 0.5 to 2.5 mm long, while the median and upper stipules are green and roughly triangular in shape.

The inflorescence stalk is 1 to 3.5 cm (0.4 to 1.4 in) long and commonly hangs below the subtending leaf. It is loosely 5 to 14 flowered with pale lilac, whitish to yellowish veined flowers. The bracts at the base of each pedicel are 0.5 to 1 mm long. The upper petal is curved at right angles and is 7 to 8 mm long. The lateral petals may be either slightly longer or shorter, while the keel is shorter and about 5 mm in length. The calyx is 2.5 to 3 mm long and possesses incurved white or partly black hairs.

The mature pod is pendulous on a stalk 2 to 9 mm long, and somewhat mottled. The pod is strongly compressed, flat, and coiled through 1.5 to 2 spirals and is 3 to 4 mm wide.

This species is somewhat similar to *Astragalus speirocarpus* (Gray) Rydb. but the flowers are very different and the fruiting pedicel is much longer.

Flowering from May to July.

HABITAT: Rocky knolls, hillsides, gullies, and washes in areas of loose sandy soils of volcanic origin. Associated plants: *Sarcobatus-Atriplex-Artemisia* zone; *Grayia spinosa, Chrysothamnus nauseosus, Cymopterus purpurascens, C. corrugatus, Leucocrinum montanum, Monolepis pusilla,* and *Phacelia gymnoclada.* Elevation: 1065-1645 m (3500-5400 ft).

KNOWN DISTRIBUTION: Humboldt County, Nevada. Oregon.

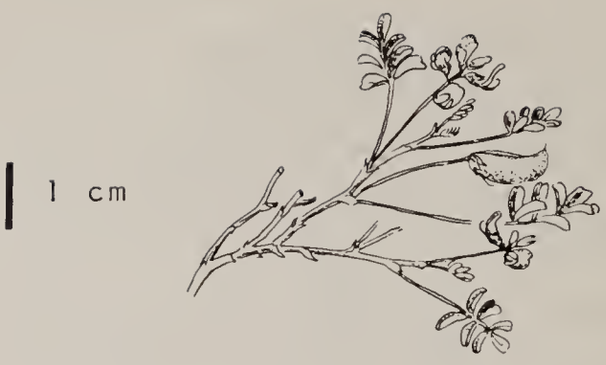
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

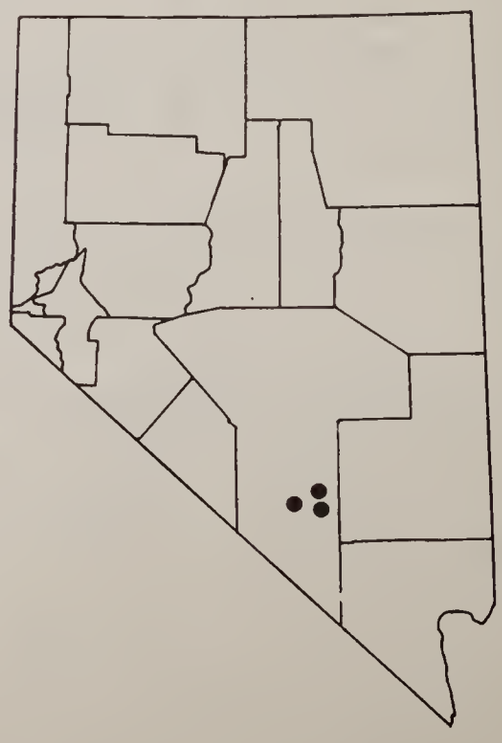
LAND OWNERSHIP/MANAGEMENT: BLM and USFWS.

EXISTING OR POTENTIAL THREATS: None known.

REMARKS: None.

ASTRAGALUS BEATLEYAE





ASTRAGALUS BEATLEYAE Barneby
Beatley Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus beatleyae* Barneby, Aliso, 7:161. 1970. Type: Reveal and Beatley, Pahute Mesa Rd., Nye County, Nevada, 6200 ft, 30 May 1968. This species is named in honor of Janice C. Beatley, one of the original collectors.

DESCRIPTION: A dwarf, loosely caespitose perennial, pubescent with straight appressed short hairs. Stems are prostrate, branch repeatedly from the base, and are up to 13 cm (5 in) long. The several stems from the tap root form a circular mat 5 to 20 cm (2 to 8 in) in diameter.

The 1.5 to 3.5 cm (0.6 to 1.4 in) long leaves have 5 to 9 emarginate leaflets spaced over a short rachis.

Racemes have 2 to 7 flowers with blue-violet petals and with the upper petal or banner abruptly curved backwards through 60° to 80°.

The fruiting pod is bladdery-inflated, 7 to 14 mm (0.3 to 0.6 in) long with a small straight or curved beak. The pods are either pale green or minutely purple speckled and minutely pubescent.

This species differs from *Astragalus gilmani* Tidest. in its appressed pubescence and less numerous leaflets. From *A. geyeri* Gray it can be distinguished by its perennial habit and the smaller whitish flowers of the former. From *A. sabulonum* Gray it can be separated by the incurved pods of the former which are clothed with spreading hairs.

Flowering in May and June.

HABITAT: Areas of shallow gravelly soil in open flat volcanic bedrock. Associated plants: *Artemisia nova, Pinus monophylla,* and *Juniperus osteosperma.* Elevation: 1705-2075 m (5600-6800 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

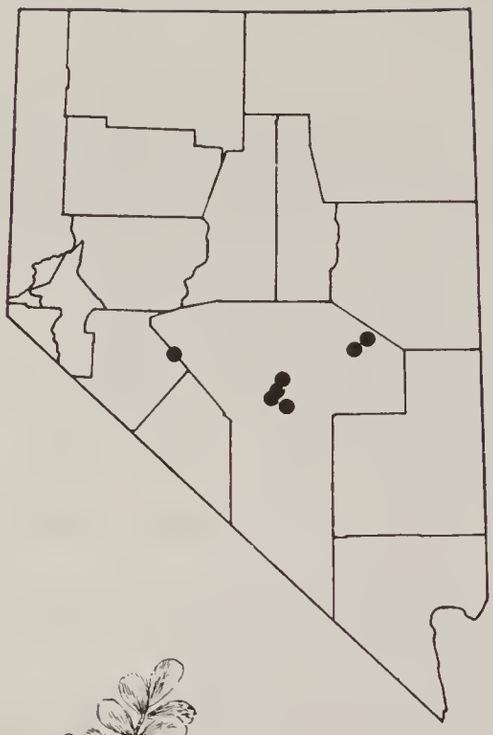
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as critically endangered, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

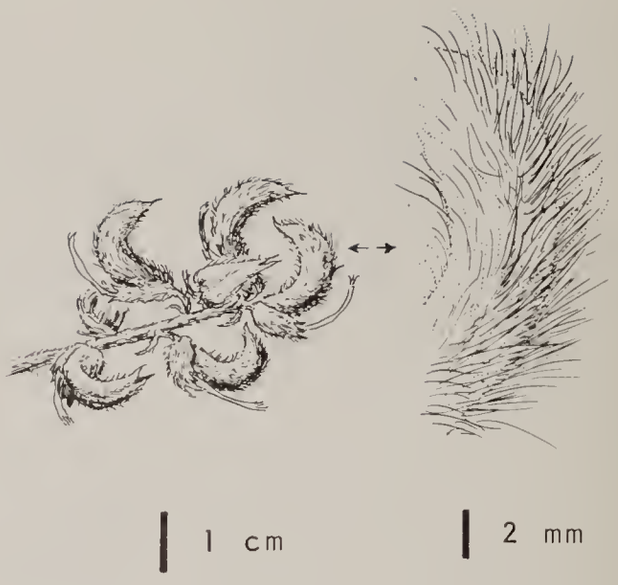
LAND OWNERSHIP/MANAGEMENT: DOE (Nevada Test Site).

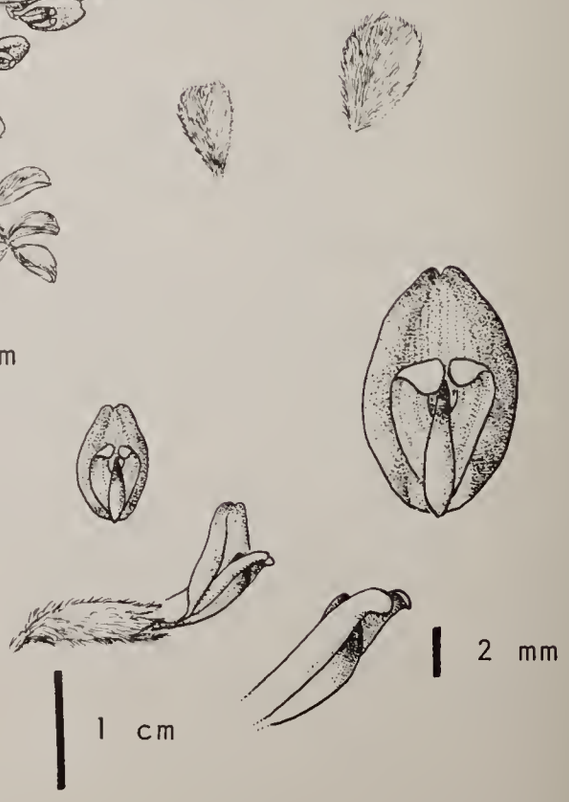
EXISTING OR POTENTIAL THREATS: Destruction of habitat by land clearing for construction. Off-road vehicles.

REMARKS: The populations of *Astragalus beatleyae* should be monitored.

ASTRAGALUS CALLITHRIX







ASTRAGALUS CALLITHRIX Barneby
Callaway Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus callithrix* Barneby, Leaflets of Western Botany, 3:103. 1942. Type: Ripley and Barneby, northeastern Nye County, Nevada, 5150 ft, 26 May 1941. The specific name, *callithrix*, refers to the beautiful hairs on the pods. This milk-vetch was first collected near Callaway which is a former name for Currant, Nevada.

DESCRIPTION: A short-stemmed or nearly stemless perennial with densely white tomentose stems and leaves. Stems few and 1 to 6 cm (0.4 to 2.4 in) long with 2 to 8 cm (0.8 to 3.2 in) long leaves with 9 to 19 broad leaflets which are obtuse or emarginate and 2 to 13 mm long.

The flowering peduncles are shorter than the leaves and bear 5 to 15 pinkish-purple flowers that are arranged loosely or sometimes more compactly in a raceme. The lateral petals are narrow and linear oblong or linear lanceolate in shape. The purplish calyx is 7 to 13 mm long.

The fruiting pods are ascending or spreading, 1 to 1.6 cm (0.4 to 0.6 in) long, 5 to 7.5 mm in diameter and strongly compressed at right angles to the partition. The pods are covered with fine, shiny, spreading, and straight or twisted hairs up to 2.5 mm long.

This species can be distinguished from the related *Astragalus marianus* (Rydb.) Barneby which, unlike this species, does not occur on dunes, by its more numerous flowers in each raceme and by its deeper flower color. From the superficially similar *A. utahensis* (Torr.) T.&G. it can be recognized by its lack of fine cottony pubescence on the pods. The similar *A. newberryi* Gray can be distinguished by its fewer leaflets and its larger pods, thinly pubescent with short curly hairs mixed with longer twisted hairs.

Flowering in May and June.

HABITAT: Deep sandy soil on the valley floor or in dunes. Associated plants: *Atriplex confertifolia, Grayia spinosa, Chrysothamnus* sp., *Gilia nyensis, Cymopterus ripleyi, Astragalus geyeri* var. *geyeri,* and *Oryzopsis hymenoides*. Elevation: 1555-1705 m (5100-5600 ft).

KNOWN DISTRIBUTION: Mineral and Nye counties, Nevada. Millard County, UT.

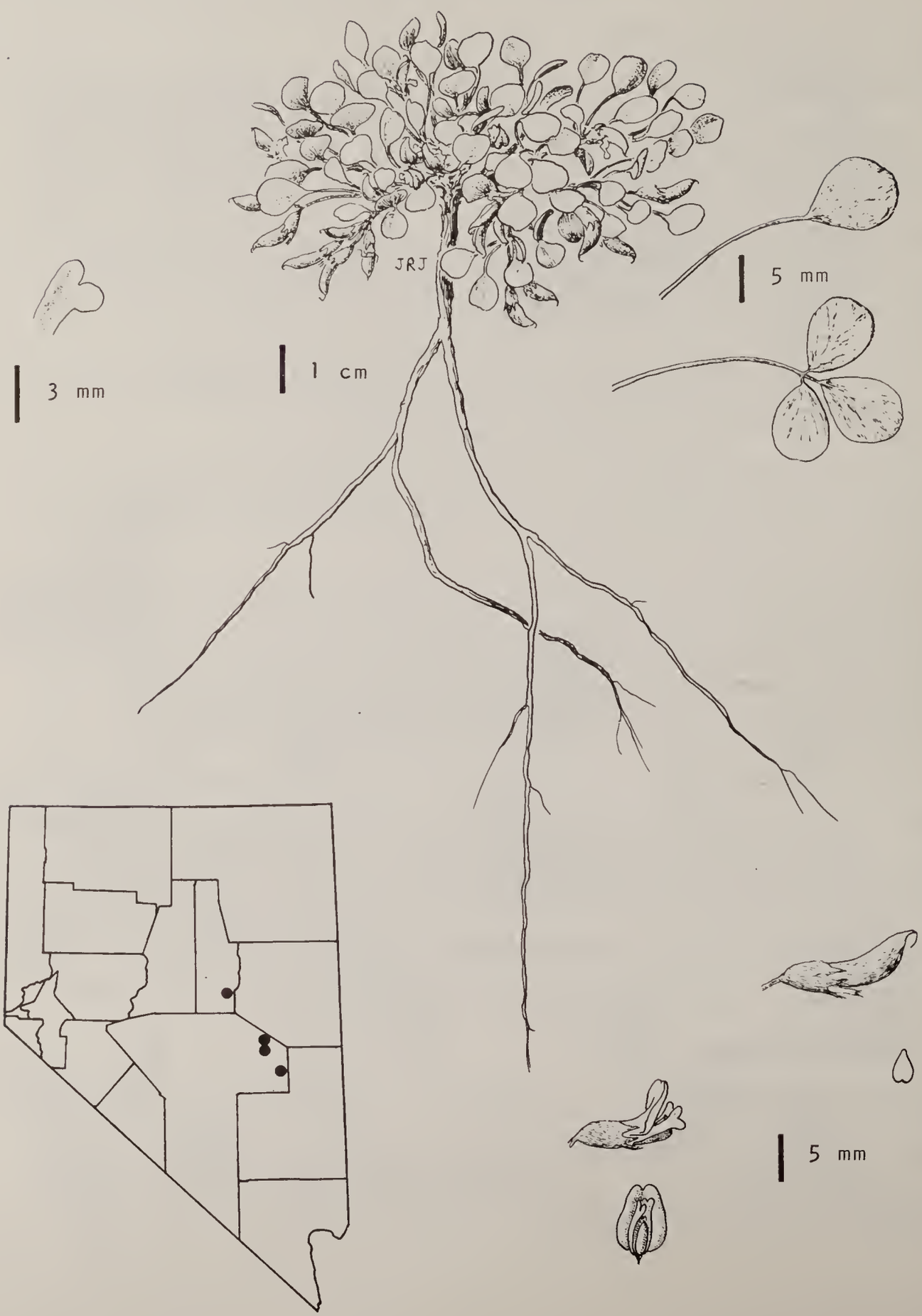
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM.

EXISTING OR POTENTIAL THREATS: Drilling for oil. Proposed MX system.

REMARKS: *Astragalus callithrix* is plentiful at times, but it apparently has a short life cycle. It is highly localized and appears to require a specialized habitat. Known populations should be monitored and it should be searched for in similar habitats.

ASTRAGALUS CALYCOSUS var. MONOPHYLLIDIUS



ASTRAGALUS CALYCOSUS Torr. var. MONOPHYLLIDIUS (Rydb.) Barneby
One Leaflet Torrey Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus calycosus* var. *monophyllidius* (Rydb.) Barneby, Leaflets of Western Botany, 3:107. 1942. Synonym: *Hamosa monophyllidia* Rydberg, North American Flora, 24:421. 1929. Type: Bentley, in the vicinity of Currant, Nevada, May 1916. The single leaflet of this taxon gives it its common name and its varietal name, *monophyllidius*. Torrey originally described *Astragalus calycosus*.

DESCRIPTION: The species, *A. calycosus*, as distinct from this variety, is a common densely caespitose perennial with 2 to 6 cm (0.8 to 2.4 in) long leaves bearing 3 to 7 leaflets which are silvery-silky.

Flowering peduncles are 2 to 5 cm (0.8 to 2 in) long and bear 2 to 6 flowers which vary from white to purple in color and are about 15 mm (0.6 in) long.

The pods are about 15 mm (0.6 in) long, and are clothed with stiff appressed hairs.

The variety *monophyllidius* is very similar to the species and differs significantly only in the leaves which typically bear only a single leaflet. On occasion there are three leaflets, however.

Flowering in May and June.

HABITAT: Open gravelly limestone hillsides. Associated plants: pinyon-juniper; *Artemisia tridentata*, *Cowania mexicana* var. *stansburiana*, *Polygala subspinosa*, *Frasera albomarginata*, *Dalea searlsiae*, *Eriogonum howellianum*, *Senecio multilobatus*, and *Cryptantha humilis*. Elevation: 1705-2135 m (5600-7000 ft).

KNOWN DISTRIBUTION: Eureka and Nye counties, Nevada.

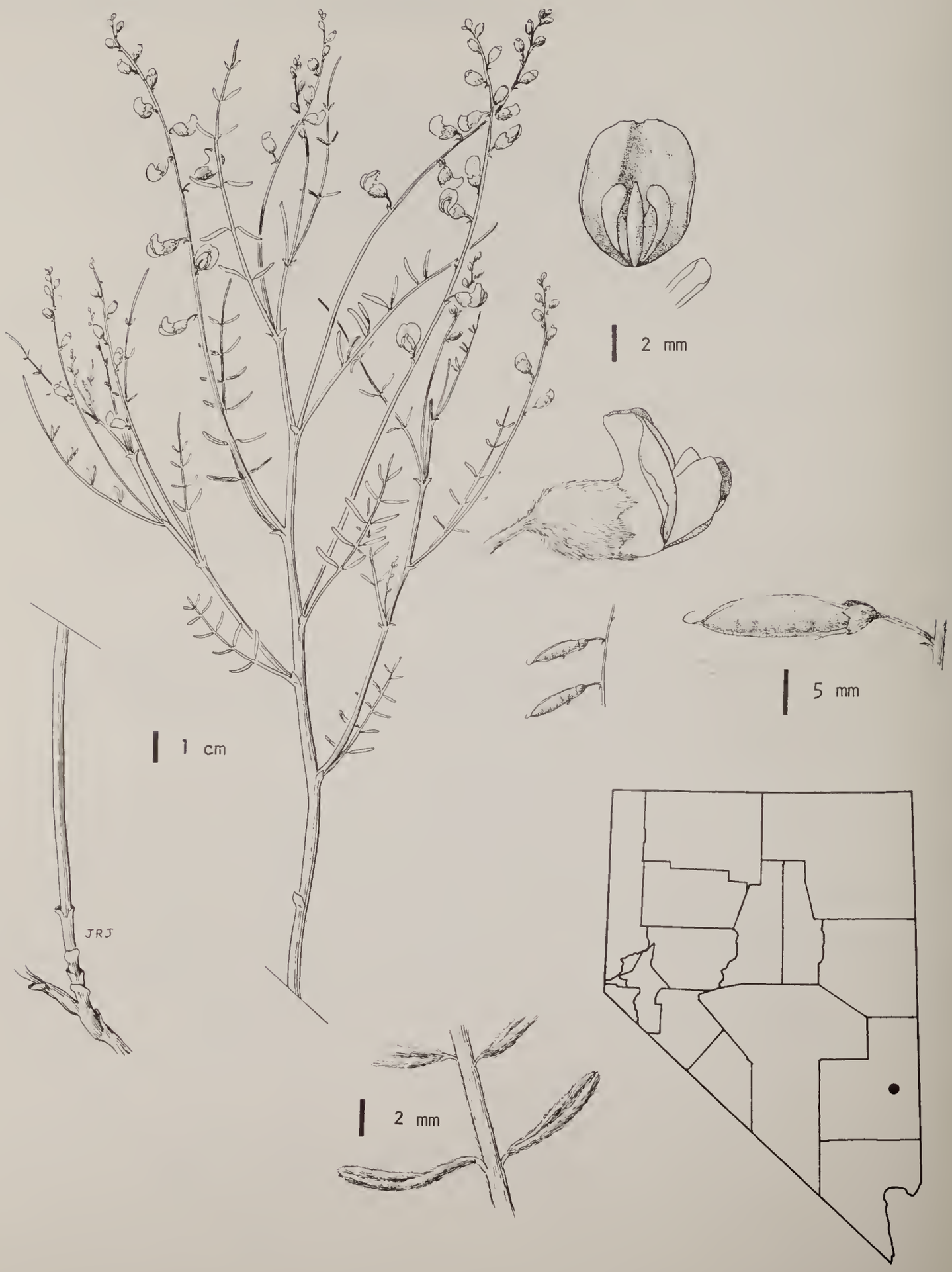
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, USFS, and private.

EXISTING OR POTENTIAL THREATS: Mining activity. Proposed MX system.

REMARKS: This taxon is only known from scattered colonies in a limited area, and it is not abundant in any of these colonies.

ASTRAGALUS CONVALLARIUS var. FINITIMUS



ASTRAGALUS CONVALLARIUS Greene var. FINITIMUS Barneby
Pine Valley Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus convallarius* var. *finitimus* Barneby, Leaflets of Western Botany, 7:192. 1954. Type: Ripley and Barneby, Washington County, Utah, 11 June 1942. The varietal name, *finitimus*, meaning closely akin refers to its relationship to var. *convallarius*.

DESCRIPTION: A sparsely leafy perennial with a buried root-crown and leaves with one to five pairs of linear or elliptic leaflets 2 to 2.5 mm long, which are not pubescent above. The leaves are commonly curled or folded toward the upper side and are about 3 mm wide.

The loosely flowered inflorescence bears small, yellowish-white flowers with an upper petal about 7.5 mm long. The lateral petals are slightly longer.

The pod is linear to lanceolate in profile and about 1.3 to 2.4 cm long by 3.4 to 4 mm wide, and compressed. The thin, papery valves of the pod are lightly pubescent.

The more common var. *convallarius* of the species apparently does not occur in the same area. It differs in having pods at least twice as long and relatively narrower. The common *A. filipes* Torr. which might be confused with this variety has more leaflets per leaf, and a similar pod supported on a slender stalk 8 to 15 mm long.

Flowering in May and June.

HABITAT: Gravelly and sandy clay hillsides; or on limestone. Associated plants: sagebrush-pinyon-juniper. Elevation: 1700-2270 m (5575-7445 ft).

KNOWN DISTRIBUTION: Lincoln County, Nevada. Utah.

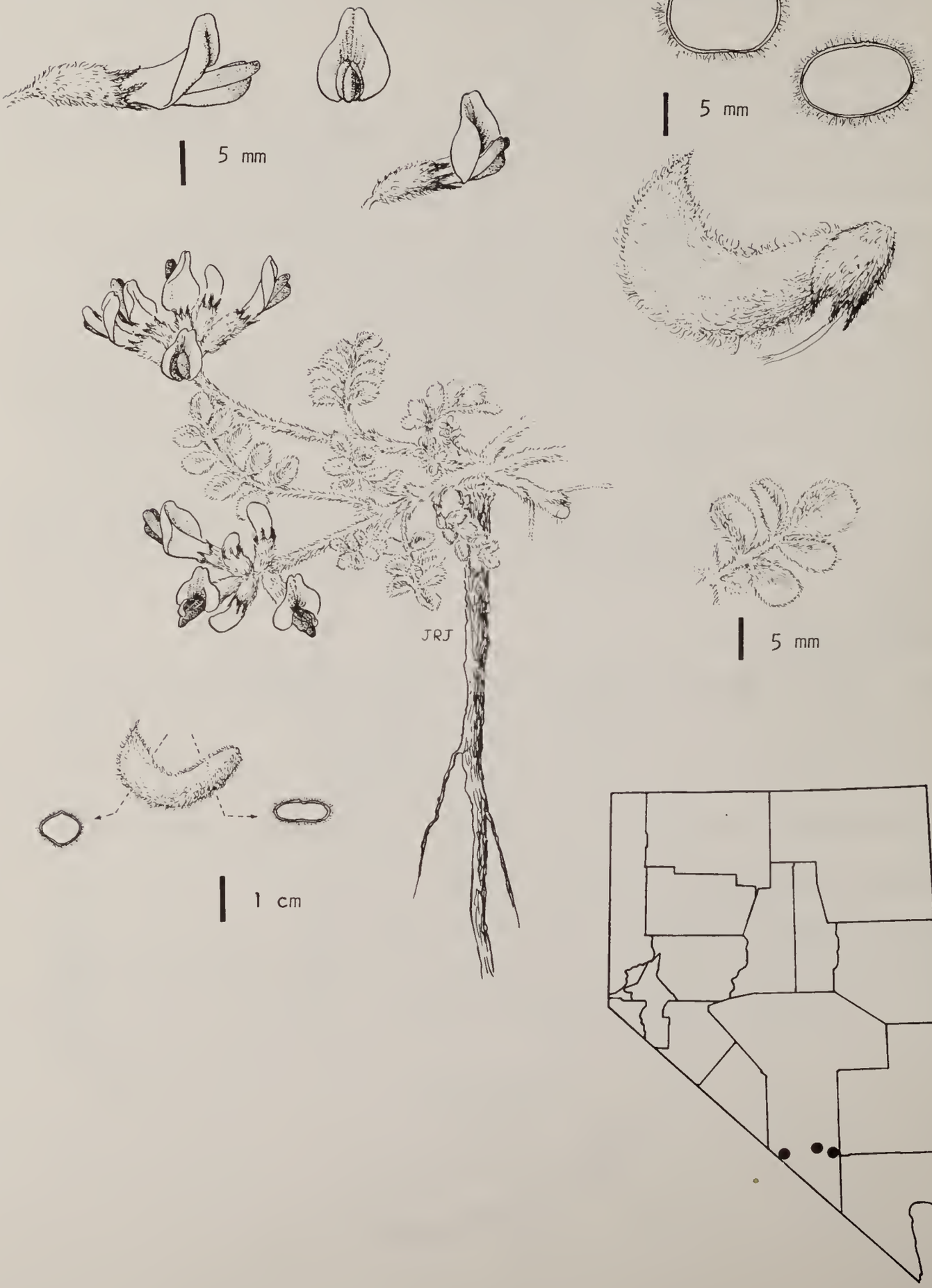
STATUS: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and/or private.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: This milk-vetch should be searched for to determine its full range. It has been rarely collected in Nevada.

ASTRAGALUS FUNEREUS



ASTRAGALUS FUNEREUS M.E. Jones
Funeral Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus funereus* M.E. Jones, Contributions to Western Botany, 12:11. 1908. Synonyms: *Xylophacos funereus* (Jones) Rydb., Bulletin of the Torrey Botanical Club, 52:367. 1925. *Astragalus purshii* var. *funereus* (Jones) Jeps., Flora of California 2:360. 1936. *A. newberryi* var. *funereus* (Jones) Clokey, Madroño, 6:214. 1942. Type: Jones, Rhyolite, Nye Co., NV, 4300 ft, 11 April 1907. This taxon was collected near the Funeral Mountains, hence the common name and the specific name.

DESCRIPTION: A perennial plant forming a mat by means of the prostrate stems developing on the rootstock. Individual stems may reach 1 dm (4 in) in length. The entire plant is covered with a dense white tangled pubescence which is frequently almost woolly. The leaves bear 7 to as many as 17 leaflets which are usually less than 5 cm (2 in) long. The oval leaflets vary between 0.5 and 1 cm in length.

The stout peduncles bear 5 to 10 flowers with calyces clothed with prominent black hairs. The flowers are pink-purple and 2.4 to 2.7 cm (about 1 in) long.

The large fruiting pods are inflated, about 5 cm (2 in) long by 1.5 cm (0.6 in) wide and clothed in a coat of long, silken wool.

The large pods of *A. funereus* are similar to those of *A. coccineus* Bdg., which, however, has scarlet flowers. From *A. utahensis* (Torr.) T.&G. it can be distinguished by its larger flowers and the presence of black hairs on the calyx.

Flowering from March to May.

HABITAT: Unstable, usually steep, gravelly slopes of volcanic tuff, or occasionally limestone screes. Associated plants: *Grayia spinosa, Chrysothamnus teretifolius, Atriplex canescens, A. confertifolia, Artemisia spinescens, Acamptopappus shockleyi, Ephedra viridis,* and sometimes *Astragalus newberryi* or *A. purshii*. Elevation: 980-2290 m (3200-7500 ft).

KNOWN DISTRIBUTION: Nye County, Nevada. Inyo County, California.

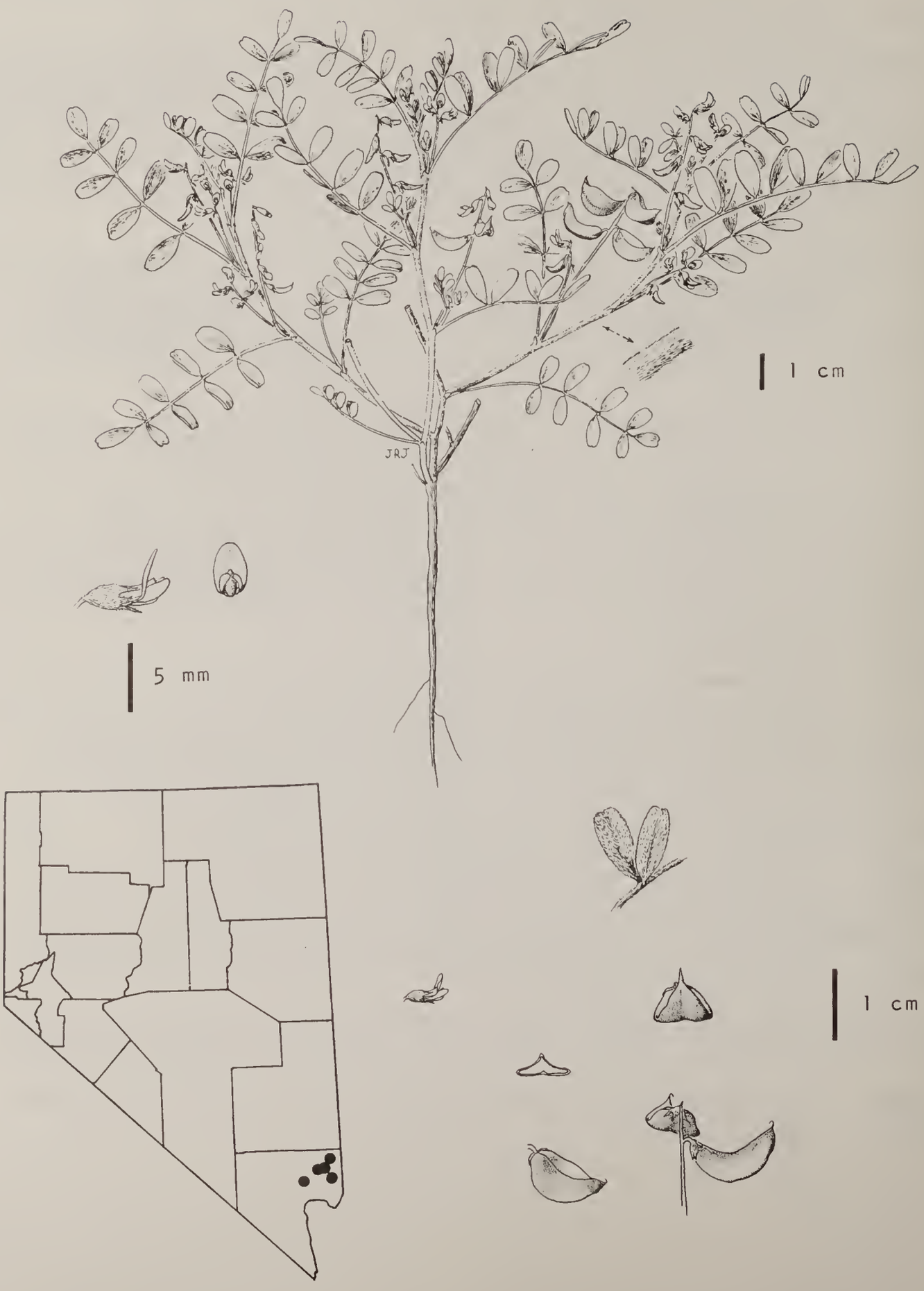
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, DOD (Nellis AFB Bombing and Gunnery Range), DOE (Nevada Test Site), National Park Service, USFWS, and private.

EXISTING OR POTENTIAL THREATS: Overgrazing. Habitat destruction by development. Mining activity. Proposed MX system.

REMARKS: The known populations of *Astragalus funereus* should be monitored.

ASTRAGALUS GEYERI var. TRIQUETRUS



ASTRAGALUS GEYERI Gray var. TRIQUETRUS (Gray) Jones
Three-cornered Pod Geyer Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus geyeri* var. *triquetrus* (Gray) Jones, Contributions to Western Botany, 8:7. 1898. Synonyms: *A. triquetrus* Gray, Proceedings of the American Academy of Arts and Sciences, 13: 367. 1878. *Phaca triquetra* (Gray) Rydberg, Flora of North America, 24:353. 1929. Type: Palmer, southeastern borders of Nevada, at the confluence of the Muddy River with the Virgin, 1877. The specific name, *triquetrus*, refers to the three-cornered pod.

DESCRIPTION: An annual plant producing somewhat flexuous stems 1 to 2 dm (4 to 8 in) long. The leaves and stems are covered with a fine ashy pubescence. The leaves are 3 to 5 cm long and bear an average of nine elliptical, retuse leaflets 4 to 15 mm long.

The flowers are small and white, while the pods are oblong, curved, triangular in cross section and somewhat flattened, and with a prominent groove on the lower side.

From typical *Astragalus geyeri* this variety differs in its pod which is more definitely triangular in cross section, and leaflets which are typically broader than the linear-oblong to linear-oblanceolate leaves of the species.

Flowering in April.

HABITAT: Sand or sandy soil, on flats, dunes, washes, and gullies. Associated plants: *Larrea tridentata, Ambrosia dumosa, Krameria parvifolia, Oryzopsis hymenoides, Amphipappus fremontii,* and sometimes with *Eriogonum viscidulum, Astragalus nyensis, A. nuttallianus* var. *imperfectus,* or *A. sabulonum.* Elevation: 455-760 m (1500-2500 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. Mohave County, Arizona.

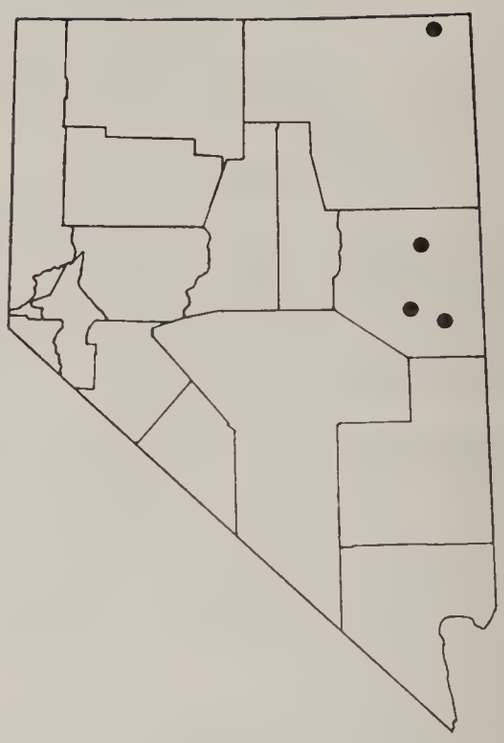
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 25 Feb 1978); endangered (Reno T/E Workshop, 9 Feb 1979); threatened (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979): protected by NRS 527.270; collection permit required.

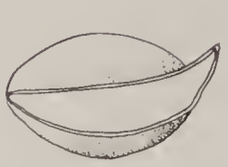
LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Off-road vehicles. Poor seed production. Insect infestation. Proposed MX system.

REMARKS: Although this taxon was believed to be extremely rare, 1979 collections have widened its range considerably. It was only found in sandy areas, but there are many other similar areas to be explored within its range. This taxon is an annual and may only appear in favorable years.

ASTRAGALUS LENTIGINOSUS var. LATUS





ASTRAGALUS LENTIGINOSUS Dougl. ex Hook. var. LATUS (Jones) Jones
Broad Pod Freckled Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus lentiginosus* var. *latus* (Jones) Jones, Review of *Astragalus*, p. 125. 1923. Synonyms: *A. diphysus* var. *latus* Jones, Zöe, 3:287. 1893. *A. latus* (Jones) Jones, Zöe, 4: 272. 1894. *Cystium latum* (Jones) Rydb., North American Flora, 24:415. 1929. Type: Jones, Schell Creek Range, White Pine County, Nevada, 1891. The specific name, *latus*, means broad and presumably refers to the pod.

DESCRIPTION: A low perennial with a woody root-stalk bearing prostrate stems up to 1.7 dm (6.8 in) long. The leaves are smooth or nearly so with only a few scattered appressed hairs on the leaf stalk and inflorescence. The leaves are 6 to 13 cm (2.4 to 5.2 in) long with broad leaflets either notched or obtuse at the end and 6 to 15 mm long.

The stalk of the inflorescence is rather short, being from 1.5 to 6 cm (0.6 to 2.4 in) long and thus shorter than the leaves. The inflorescence characteristically bears 5 to 12 flowers. The flowering calyx is 7 to 12.5 mm long with a pubescence of black, appressed hairs. The flowers are pinkish-purple and the larger upper petal attains a length between 15 and 19 mm (0.6 to 0.8 in).

The pod is inflated and ovoid or nearly spherical in shape with a short curved beak. The pods vary in length from 1 to 2.5 cm (0.4 to 1 in) and the green and red-mottled smooth valves eventually become leathery and straw-colored.

The strongest character which differentiates this variety from other similar varieties of *Astragalus lentiginosus* is the partition in the pod which continues on into the apex of the beak.

Flowering from May to July.

HABITAT: Brushy or open gravelly slopes, limestone. Associated plants: pinyon-juniper, *Artemisia tridentata*, *A. frigida*, *Chrysothamnus viscidiflorus*, *Haplopappus macronema*, *Oxytropis parryi*, *Stipa* sp., or *Leucopoa* sp. Elevation: 2290-2900 m (7500-9500 ft).

KNOWN DISTRIBUTION: Elko and White Pine counties, Nevada.

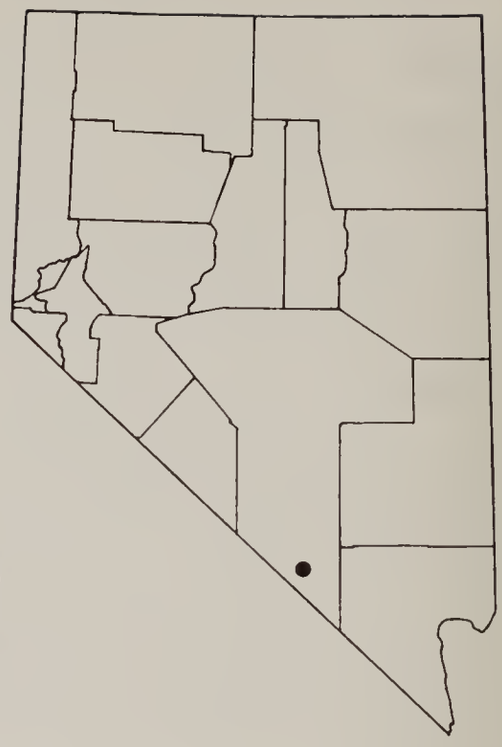
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, USFS, and possibly private.

EXISTING OR POTENTIAL THREATS: Grazing by animals (these plants are palatable). Proposed MX system.

REMARKS: If dormant mining operations are reactivated, this may also pose a threat in some areas.

ASTRAGALUS LENTIGINOSUS var. MICANS



ASTRAGALUS LENTIGINOSUS Dougl. ex Hook. var. MICANS Barneby
Shiny Freckled Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus lentiginosus* var. *micans* Barneby, Leaflets of Western Botany, 8:22. 1956. Type: Roos, Inyo Co., California, 13 May 1955. The varietal name, *micans*, means shining and refers to the silvery hairs that cover the plants.

DESCRIPTION: A perennial with numerous stems forming clumps 5 to 7 dm (20 to 28 in) in diameter, and somewhat woody at the base. The stems and leaves are very densely pubescent with silvery or white-silky hairs. The leaves vary from 4.5 to 9.5 cm (1.8 to 3.8 in) long and have 11 to 17 narrow to broad leaflets, individually 5 to 14 mm long.

The inflorescence bears 20 to 35 pink-lavender flowers with silky pubescent calyces 6 to 7.6 mm long and a corolla with the broad upper petal 12 to 14 mm long.

The pod at maturity is inflated, 1.5 to 2 cm (0.6 to 0.8 in) long, with a beak 2.5 to 4 mm long, and is very densely silky-pubescent.

The silky-pubescence and large, somewhat shrubby habit make this an easily identified species in its known habitat. From the related *Astragalus lentiginosus* var. *fremontii* (A. Gray) S. Wats. it can be separated by the former's less shrubby habit and smaller flowers.

Flowering from April to June.

HABITAT: Sandy soil, occasionally on dunes. Associated plants: *Ambrosia dumosa*, *Larrea tridentata*, *Oryzopsis hymenoides*, *Atriplex* sp., *Ephedra* sp., *Lycium shockleyi*, *Lepidium fremontii*, and *Astragalus preussii* var. *preussii*. Elevation: 700-1100 m (2300-3600 ft).

KNOWN DISTRIBUTION: Nye County, Nevada. Inyo County, California.

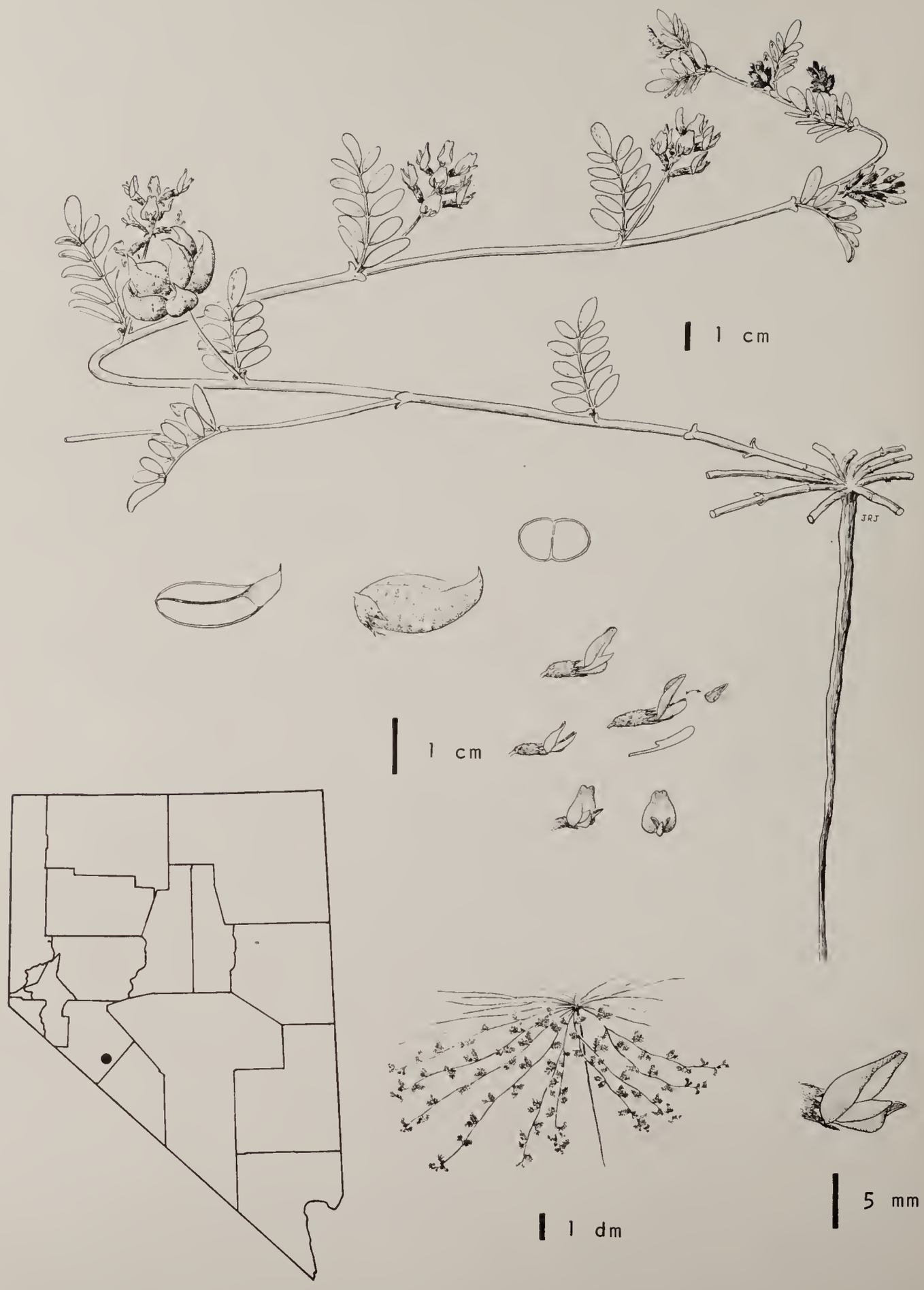
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and DOE (Nevada Test Site).

EXISTING OR POTENTIAL THREATS: Off-road vehicles. Proposed MX system.

REMARKS: None.

ASTRAGALUS LENTIGINOSUS var. SESQUIMETRALIS



ASTRAGALUS LENTIGINOSUS Dougl. ex Hook. var. SESQUIMETRALIS (Rydb.) Barneby

Sodaville Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus lentiginosus* var. *sesquimetralis* (Rydb.) Barneby, Leaflets of Western Botany, 4:116. 1945.
Synonym: *Cystium sesquimetrale* Rydberg, North American Flora, 24:414. 1929.
Type: Shockley, Soda Springs, Nevada, 11 June 1882. Soda Springs became Sodaville with the establishment of a post office in October 1882. The varietal name, *sesquimetralis*, means one and one-half meters and refers to the diameter of the plant.

DESCRIPTION: A prostrate perennial with straw-colored stems up to 8 dm (32 in) long and tomentose with fine, somewhat appressed hairs. The leaves are 2 to 5 cm long and smooth or with a few appressed hairs above. The leaflets are 6 to 18 mm long with the terminal one obviously the longest.

The flowering stalks are 1.5 to 4 cm (0.6 to 1.6 in) long, and bear 6 to 12 light purple flowers with white-silky calyces. The calyx is 7 to 8 mm long while the large upper petal is about 14 mm long.

The pod is ovate or somewhat narrower, moderatly inflated, and 1.6 to 2.6 cm (0.6 to 1 in) long. The surface is tomentose with fine appressed hairs and there is an upwardly curved beak.

This is an easily recognized variety of *Astragalus lentiginosus* confined to low saline areas and with characteristic long creeping stems and long internodes compared to the relatively short leaves. This variety can be separated from the similar variety *albifrons* by the latter's considerably shorter petals and a pod with a downwardly curved beak.

Flowering from April to May.

HABITAT: Powdery clay saline soil, some areas covered by small dark rocks. Associated plants: *Sarcobatus vermiculatus*, *Suaeda torreyana*, *Distichlis spicata* var. *stricta*, *Chrysothamnus nauseosus*, *Atriplex lentiformis*, *Ivesia kingii*, and *Crepis runcinata*. Elevation: 990-1420 m (3250-4650 ft)

KNOWN DISTRIBUTION: Mineral County, Nevada. Inyo County, California.

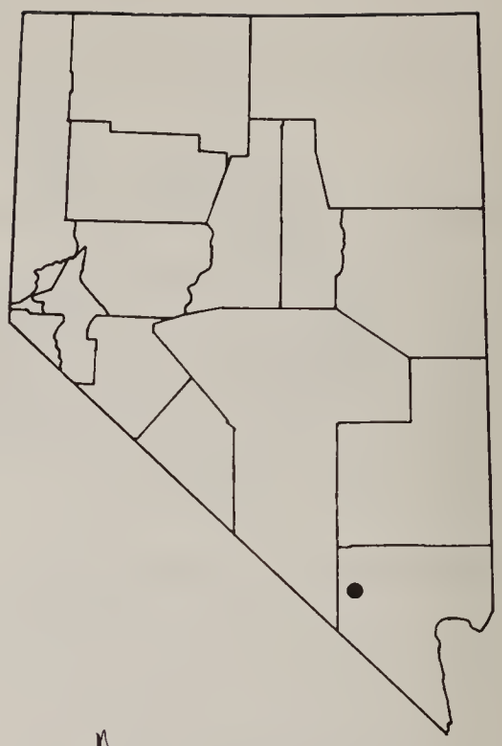
STATUS: Possibly extinct (1975 *FR*); endangered (1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

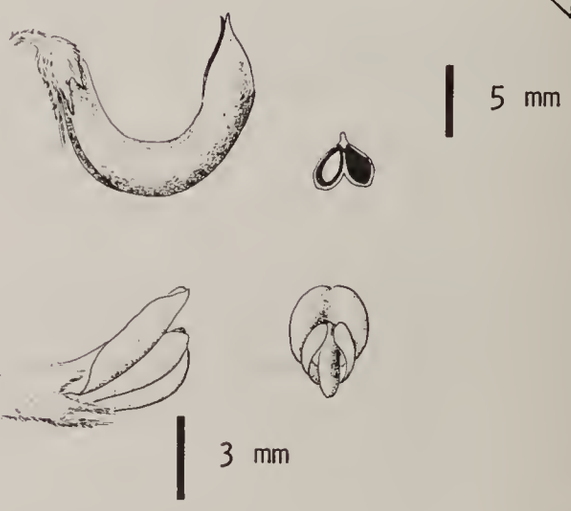
LAND OWNERSHIP/MANAGEMENT: Private.

EXISTING OR POTENTIAL THREATS: Geothermal drilling. Any other change in the water supply from the springs. Feral burros and cattle trample the area.

REMARKS: This taxon has been searched for extensively, but it apparently is restricted to two similar edaphic sites.

ASTRAGALUS MOHAVENSIS var. HEMIGYRUS





ASTRAGALUS MOHAVENSIS S. Wats. var. HEMIGYRUS (Clokey) Barneby
Half-ring Pod Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus mohavensis* var. *hemigyrus* (Clokey) Barneby, El Aliso, 2:207. 1950. Synonyms: *Astragalus albens* sensu Jones (not Greene), Revision of North American Astragalus, p. 261. 1923. *Astragalus hemigyrus* Clokey, Madroño, 6:220. 1942. Type: Clokey, south of Indian Springs, Clark Co., Nevada, 18 April 1939. The pods of this milk-vetch are arched through half a circle, giving rise to the common name and the varietal name, *hemigyrus*.

DESCRIPTION: A bushy, silvery-pubescent perennial with numerous stems reaching 4 dm (16 in) in height. However, as the drawings show, the plant size is quite variable. The leaves are 5 to 10 cm (2 to 4 in) long and bear 7 to 11 leaflets 6 to 15 mm long, which are elliptic and either blunt or somewhat indented at the apex.

The inflorescence is somewhat longer than the leaves and bears purple flowers 6 to 8 mm long. The 5 mm long calyx is pubescent with white and black hairs.

At maturity the pods are not inflated, and are strongly curved into a half-circle with a short beak. The dry pod is somewhat leathery and has a strong network of veins on the surface.

From the similar *Astragalus layneae* Greene this species can be separated by its short stipules (2 mm) compared to the much larger (7 to 10 mm) ones of *A. layneae*. The latter species also has more leaflets (13 to 23) and flowers which are over twice as large and are white with purple tips. *A. mohavensis* var. *mohavensis* can be distinguished by its broader pods which are rarely as incurved as those of var. *hemigyrus*.

Flowering from April to June.

HABITAT: Limestone ledges and gravelly hillsides. Associated plants: *Larrea tridentata* and *Juniperus osteosperma*. Elevation: 1240-1850 m (4065-6070 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. Inyo County, California.

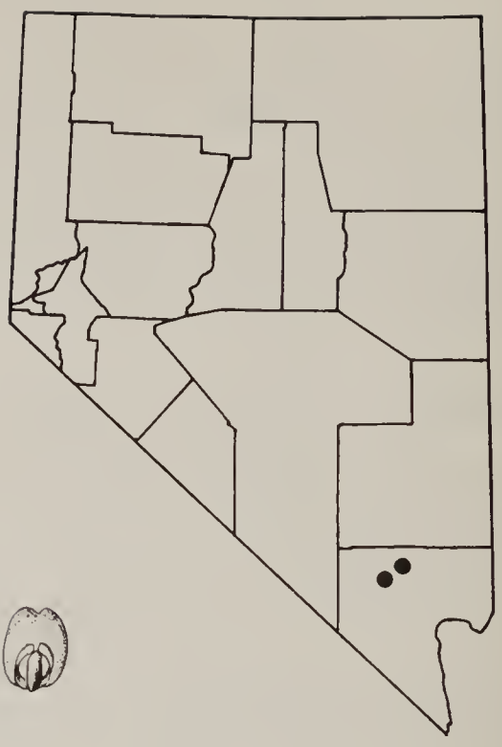
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and possibly private.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: As far as is known, this milk-vetch has not been collected in Nevada in the last 40 years. It was looked for unsuccessfully in 1979. A concerted effort should be made to relocate this rare taxon.

ASTRAGALUS MUSIMONUM



ASTRAGALUS MUSIMONUM Barneby
Sheep Range Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus musimonum* Barneby, Proceedings of the California Academy of Sciences, 4:150. 1944.
Type: Ripley and Barneby, calcareous gravel slopes of the Sheep Range, near the entrance to Deadman Canyon, Clark County, Nevada, 5700 ft, 5 May 1941.

DESCRIPTION: A low, tufted perennial which is densely silvery pubescent throughout with straight, appressed hairs up to 1.2 mm long. The prostrate stems are very short, to 2 cm (0.8 in) or exceptionally to 7 cm (2.8 in) long. The internodes are also short, varying from shorter to twice the length of the 3 to 4 mm stipules. The leaves are 4 to 7 cm (1.6 to 2.8 in) long and bear 11 to 17 small leaflets 3 to 7 mm long.

The flowering stalks are 4 to 8 cm (1.6 to 3.2 in) long and bear 5 to 9 pink-purple flowers which have a large upper petal with a length of 10 to 13 mm.

The pods are either ascending or incurved-ascending, about 1.5 to 2 cm (0.6 to 0.8 in) long, compressed with a central ridge on the lower surface lying in a double groove. The valves of the pod are densely pubescent with appressed hairs and are unmottled. Eventually, they become leathery and brownish.

The general aspect of the plant resembles that of *Astragalus amphioxys* Gray; the latter species, however, differs in its larger flowers and its thick-walled or woody pods contrasted with the thin-walled pods of *A. musimonum*. From the related *A. argophyllus* var. *panguicensis* (Jones) Jones it can be separated by its shorter calyx lobes, more numerous flowers, more copius pubescence of straight appressed hairs, and very differently shaped pods.

Flowering from April to June.

HABITAT: Dry limestone bajadas and gentle slopes, along dirt roads, and disturbed areas. Associated plants: pinyon-juniper, *Coleogyne ramosissima*, *Atriplex confertifolia*, *Artemisia spinescens*, and *Yucca brevifolia*. Elevation: 1340-1920 m (4400-6300 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

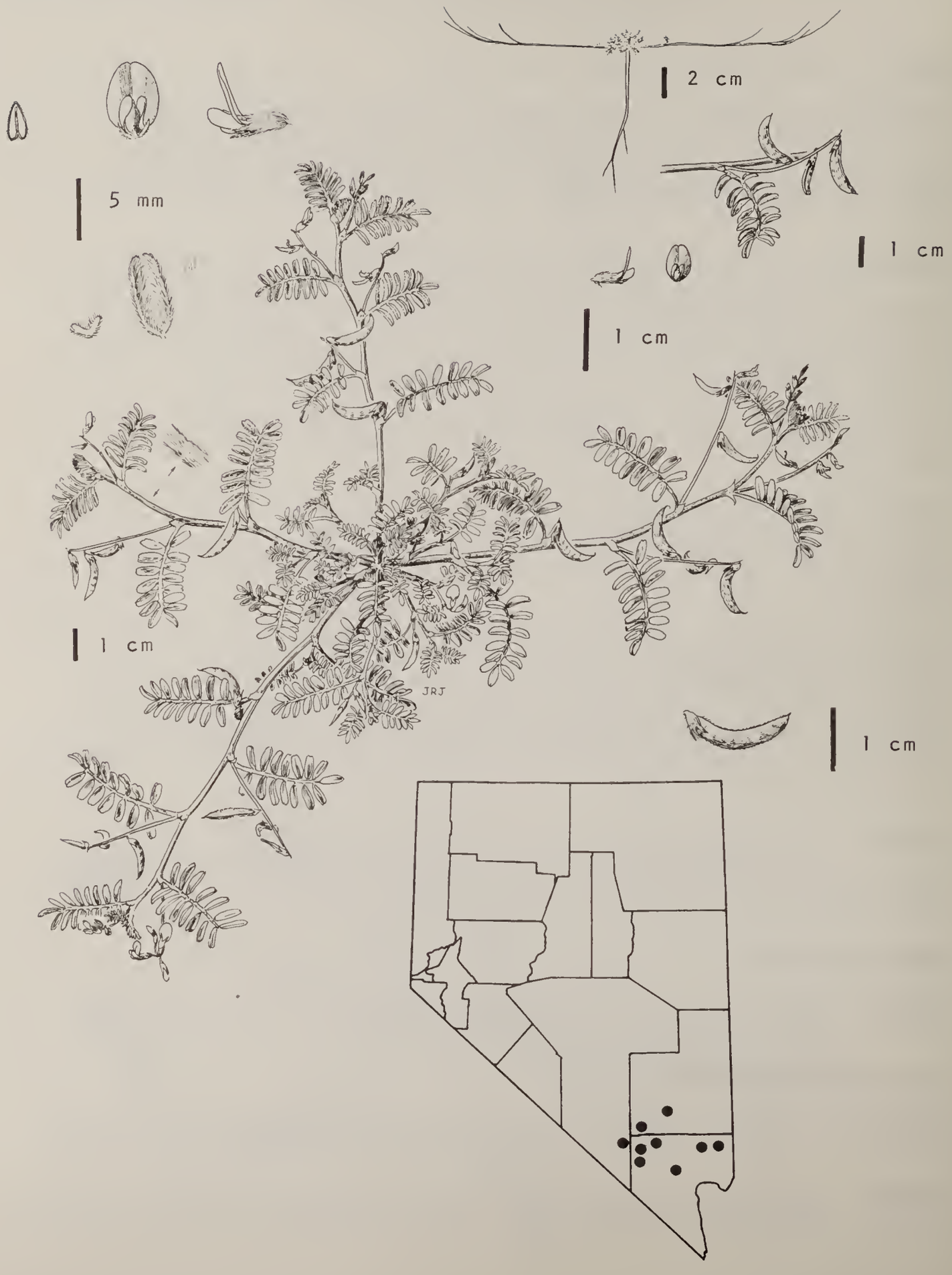
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFWS.

EXISTING OR POTENTIAL THREATS: If the present management policies continue, there are no threats to this taxon.

REMARKS: This taxon is locally plentiful, but it is only known from the Desert National Wildlife Range. These populations should be monitored.

ASTRAGALUS NYENSIS



ASTRAGALUS NYENSIS BARNEBY
Nye Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus nyensis* Barneby, Leaflets of Western Botany, 7:195. 1954. Synonym: *A. nuttallianus* var. *pilifer* Barneby, Leaflets of Western Botany, 3:110. 1942. Type: Ripley and Barneby, Spotted Range, Nye County, Nevada, 3200 ft, 14 May 1941. The common name and the specific name, *nyensis*, are both taken from the name of the county where the type collection was made.

DESCRIPTION: A slender, diffuse annual which is pubescent throughout with stiff, straight, or curved hairs up to 1 mm long. The stems are 1 to 17 cm (0.4 to 6.8 in) long, with the central one usually erect. The leaves are 1 to 4 cm (0.4 to 1.6 in) long with 7 to 13 oblong-ovate retuse leaflets which are equally pubescent on both sides or somewhat less so on the upper surface.

The short inflorescence bears one to four flowers which are whitish with the upper petal faintly lilac-tinted and 4.2 to 5.4 mm long. The lower petals (fused to form the keel) have a blunt apex, a distinguishing feature which helps to separate it from the somewhat similar *A. acutirostris* S. Wats. which has, however, an acute keel and an inflorescence stalk longer than the adjacent leaf, unlike *A. nyensis*.

A. nyensis produces a linear-oblong pubescent pod which is incurved and 1.3 to 1.8 cm long and somewhat compressed-triangular in cross section.

A. nuttallianus var. *imperfectus* (Rydb.) Barneby can be separated from the similar *A. nyensis* by the former's appressed pubescence, and elliptic and acute leaflets.

Flowering in April and May.

HABITAT: Outwash fans and gravelly flats, sometimes in sandy soil. Associated plants: *Larrea tridentata, Ambrosia dumosa, Oryzopsis hymenoides, Hymenoclea salsola, Coleogyne ramosissima, Hilaria rigida, Krameria parvifolia, Astragalus geyeri* var. *triquetrus*, or *A. nuttallianus* var. *imperfectus*. Elevation: 520-1705 m (1700-5600 ft).

KNOWN DISTRIBUTION: Clark, Lincoln, and Nye counties, Nevada.

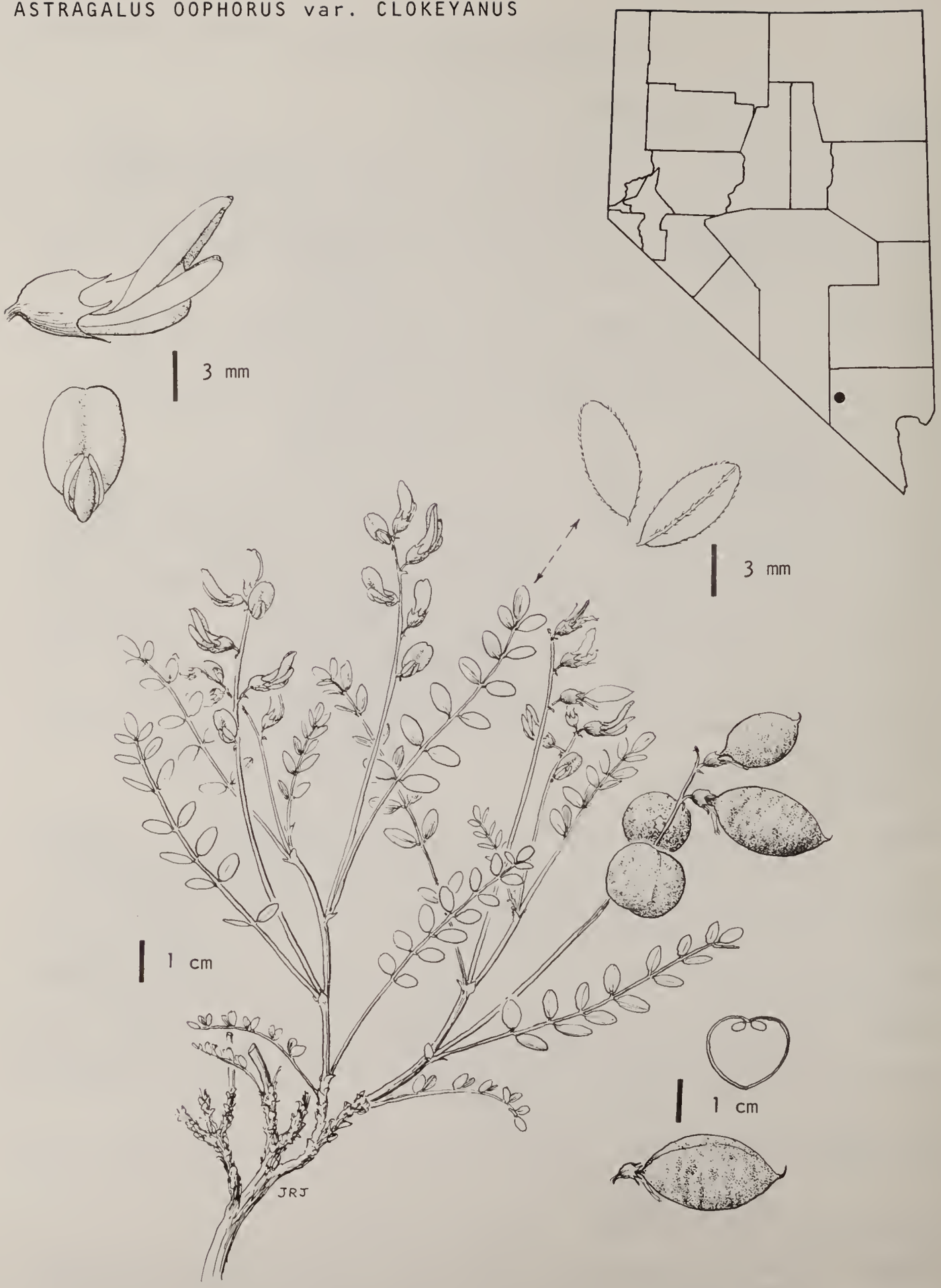
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP/MANAGEMENT: BLM, DOE (Nevada Test Site); USFS, USFWS, and private.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: Because it is an annual, some years it may be difficult to locate *A. nyensis*, however, in 1979 it was abundant. Also, it is an inconspicuous plant and it is difficult to distinguish it from other annual astragali and hence it may have been overlooked previously.

ASTRAGALUS OOPHORUS var. CLOKEYANUS



ASTRAGALUS OOPHORUS S. Wats. var. CLOKEYANUS Barneby
Lee Canyon Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus oophorus* var. *clokeyanus* Barneby, Leaflets of Western Botany, 7:194. 1954. Synonym: *Astragalus artipes* sensu Clokey (not Gray) Madroño, 6:216. 1942. Type: Train, Lee Canyon, Charleston (Spring) Mountains, Clark Co., NV, 9000 ft. This variety is named for Ira W. Clokey, author of a *Flora of the Charleston Mountains*.

DESCRIPTION: A low slender perennial with stems up to 1 dm (4 in) long. The stems and leaves are not pubescent or only slightly so. The leaflets are small and less than 1 cm long, and ovate or elliptic in shape.

The inflorescence bears loosely arranged small purplish flowers with upper petals about 5 mm wide. The calyx is about 6 mm long including the 2 mm calyx teeth.

The pod averages about 2 to 2.5 cm in length, and at maturity splits into two papery valves. It is supported on a slender stalk 4 to 8 mm long.

The var. *oophorus* S. Wats. of the species does not occur in the same locale and can be distinguished from var. *clokeyanus* by the latter's smaller flowers and smaller pods (2 to 2.5 cm compared to 3.5 to 5.5 cm). From somewhat similar species this variety can be distinguished by its hairless calyx, and inflated stalked pod.

Flowering in June and July.

HABITAT: Ridges and open slopes in gravelly soil derived from limestone. Associated plants: *Pinus ponderosa* var. *scopulorum*, sagebrush-pinyon-juniper. Elevation: 2075-2775 m (6800-9100 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

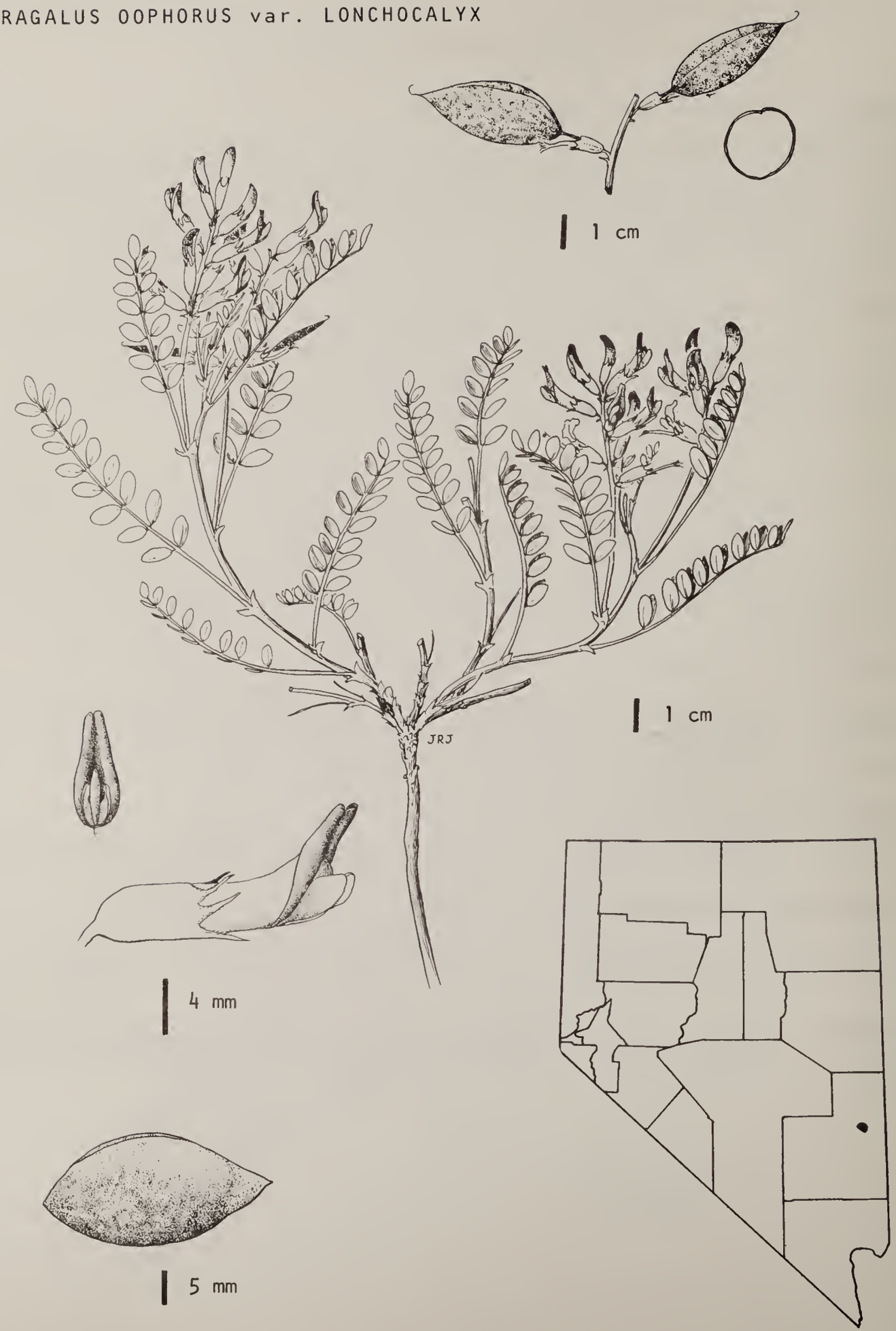
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and USFS.

EXISTING OR POTENTIAL THREATS: Recreational use of the area. Proposed MX system (indirectly).

REMARKS: This is a highly localized, rarely collected milk-vetch. An effort should be made to relocate this taxon and learn more about its habitat.

ASTRAGALUS OOPHORUS var. LONCHOCALYX



ASTRAGALUS OOPHORUS S. Wats. var. LONCHOCALYX Barneby
Long Calyx Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus oophorus* var. *lonchocalyx* Barneby, Leaflets of Western Botany, 7:194. 1954. Type: Train, Fay, Lincoln County, Nevada, 6600 ft, 24 April 1939. This variety has a long narrow flower and calyx.

DESCRIPTION: A low and slender perennial with stems up to 1 dm (4 in) long. The stems and leaves are not pubescent or only slightly so. The leaflets are small and less than 1 cm long, and ovate or elliptic in shape.

The inflorescence bears loosely arranged small purplish flowers with a long, narrow calyx tube and lateral petals which are linear-oblong and up to 11.5 mm long.

The pods are 3.5 to 5.5 cm (1.4 to 2.2 in) long and at maturity split into two papery valves.

The long, narrow flowers immediately distinguish this variety from the other forms of *A. oophorus*. Other species which may be found in the same area with similar flowers do not have the vegetative or fruiting form of *A. oophorus*.

Flowering in May and June.

HABITAT: Dry gravelly hillsides and stony flats; limestone. Associated plants: pinyon-juniper; associated with sagebrush and sometimes sheltering under it. Elevation: 1830-2590 m (6000-8500 ft).

KNOWN DISTRIBUTION: Lincoln County, Nevada. Utah.

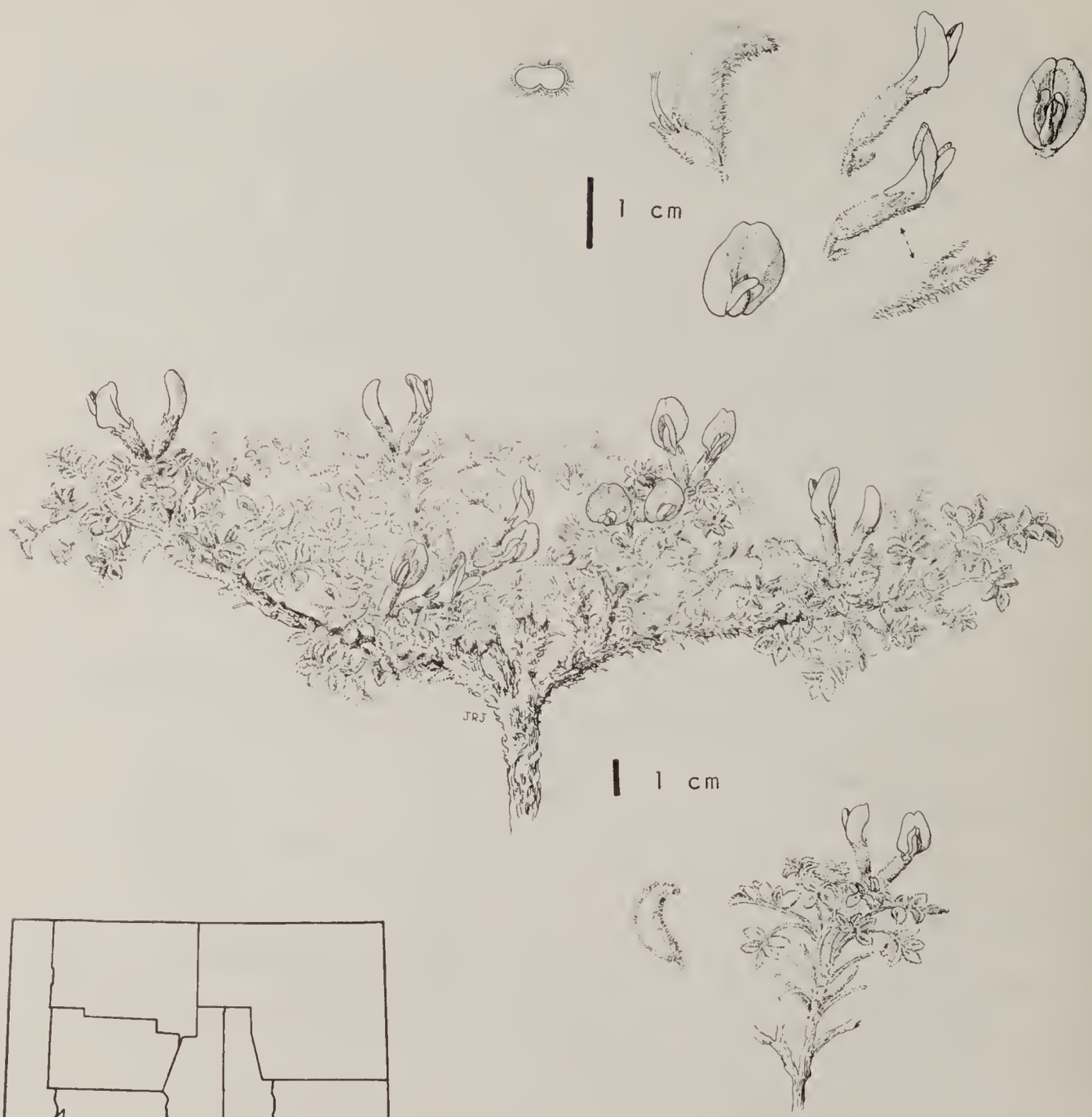
STATUS: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

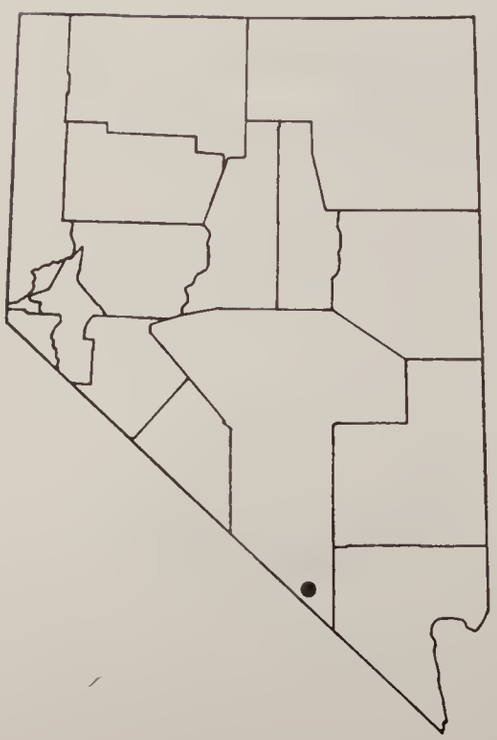
LAND OWNERSHIP/MANAGEMENT: BLM.

EXISTING OR POTENTIAL THREATS: Chaining of sagebrush. Proposed MX system.

REMARKS: This taxon should be searched for to determine its full range.

ASTRAGALUS PHOENIX





ASTRAGALUS PHOENIX Barneby
Ash Meadows Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus phoenix* Barneby, Madroño, 20:395. 1970. Type: Cronquist, Ash Meadows, Nevada, 21 April 1966. First collected by Purpus in Ash Meadows, Nye County, in 1898. The specific name, *phoenix*, refers to being born of ashes and is descriptive of the plant's dense ashen mound of leaves partly covered over with fine white soil.

DESCRIPTION: A low matted perennial forming mounds 40 to 50 cm (16 to 20 in) across. The older stems characteristically have a flaking bark. The leaves, which are densely covered with coarse, white hairs, are 1.5 to 3.5 cm (0.6 to 1.4 in) long and bear 2 to 3 ovate to obovate leaflets which are 3 to 7 mm long. The stipules are 2 to 3 mm long, pubescent on the outer surface and glabrous on the inner surface.

The pinkish to purple flowers are borne on short, erect stems in the mat and commonly number only one or two per inflorescence. Individual peduncles are 2 to 5 mm long. The 12.5 to 15 mm (0.5 to 0.6 in) calyx is covered with long hairs. The acute calyx teeth are 3 to 4 mm long. The upper petal is about 25 mm (1 in) long and 10.5 mm (0.4 in) wide, while the two lateral petals are about 20 mm (0.8 in) long.

The densely pubescent pod is 1.5 to 2 cm (0.6 to 0.8 in) long by 1 cm (0.4 in) in diameter, and is tipped by a short hook, which is incurved.

No other species occurs within the known range of *Astragalus phoenix* with which it could easily be confused. The flowers are very similar to those of *A. newberryi* Gray, but the latter is vegetatively very different in that it does not form the dense mound of foliage typical of *A. phoenix*.

Flowering in late April and May.

HABITAT: Dry, hard, white, barren saline, clay flats, knolls, and slopes. Associated plants: *Atriplex confertifolia, Mentzelia leucophylla, Haplopappus acradenius, Distichlis spicata* var. *stricta*, and *Enceliopsis nudicaulis* var. *corrugata*. Elevation: 670-725 m (2200-2380 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

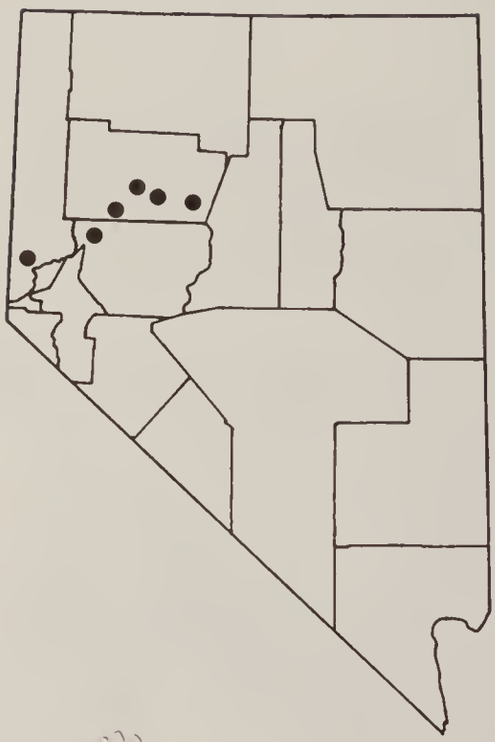
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Utilization of land for agricultural or other developmental purposes. Free roaming horses. Dust from disturbed soil may smother the plants. Proposed MX system (indirectly).

REMARKS: *Astragalus phoenix* has a very limited distribution, any loss of habitat is critical. These plants only grow in areas of mineral encrusted soil, never in disturbed areas.

ASTRAGALUS PORRECTUS



1 cm

5 mm

1 cm

ASTRAGALUS PORRECTUS S. Wats.
Lahontan Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus porrectus* S. Watson, "Botany," pp. 75, 444. *In*: C. King, Report of the geological explorations of the Fortieth Parallel. Vol. 5. 1871. Synonyms: *Tragacantha porrecta* (S. Wats.) O. Kuntze, Revue générale de botanique, 2:947. 1891. *Homalobus porrectus* (S. Wats.) Rydb., Bulletin of the Torrey Botanical Club, 5:19. 1924. Type: Watson, Trinity Mountains, NV, 5000 ft, May. The specific name, *porrectus*, means to be stretched out, apparently referring to the elongate raceme.

DESCRIPTION: A tall, stiff perennial with stems to 40 cm (16 in) long. The leaves vary from 3.5 to 11 cm (1.4 to 4.4 in) in length and produce relatively few (approximately 9 to 13) broad, leathery leaflets borne some distance from one another on the leaf axis. The leaflets have a few hairs along the margin. The thin dry stipules are 2 to 9 mm long, with the lowermost pairs fused into a sheath surrounding the stem.

The inflorescence bears 12 to 33 creamy-white flowers which are relatively distant from each other. The calyx is about 5 mm long and is pubescent with black appressed hairs. The upper petal of the flower is 8 to 11 mm (0.3 to 0.4 in) long while the two lateral petals average 8 to 9 mm in length. The keel is 6 to 8 mm long.

The pods are glabrous, green, or sometimes purple tinged or mottled. The two valves eventually become leathery and straw-colored and may be purple tinged. The mature pods have an upward curvature and are 8 to 15 mm (0.3 to 0.6 in) long and 3 to 5 mm in diameter.

This is an easily recognized *Astragalus* because of its sheathing lower stipules, the relatively few leathery leaflets, and its open inflorescence of small creamy-white flowers followed by incurved and laterally compressed pods.

Flowering in May and June. Fruit long persisting.

HABITAT: Hot gravelly washes and outwash fans in the foothills of desert mountains, in volcanic sand or rock debris. Associated plants: *Atriplex confertifolia, Artemisia tridentata, Grayia spinosa, Hymenoclea salsola, Chrysothamnus nauseosus, Tetradymia glabrata, Ceratoides lanata,* and *Sarcobatus vermiculatus*. Elevation: 1310-1525 m (4300-5000 ft).

KNOWN DISTRIBUTION: Churchill, Pershing, and Washoe counties, Nevada.

STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Grazing by animals. Destruction of pods. Proposed MX system.

REMARKS: Recent collections have extended the range of this taxon. It may be a relic of a formerly more widely dispersed flora; it is not closely allied to any other *Astragalus* in this area.

ASTRAGALUS PSEUDIODANTHUS

ASTRAGALUS PSEUDIODANTHUS Barneby
Tonopah Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus pseudiodanthus* Barneby, Leaflets of Western Botany, 3:99. 1942. Type: Ripley and Barneby, Nye County, Nevada, 5500 ft, 3 June 1941. This species is deceptively like *A. iodanthus*, hence the specific name, *pseudiodanthus*. The type was collected southeast of Tonopah.

DESCRIPTION: A perennial with radiating, prostrate stems 3 dm (12 in) long. The leaves are 2.5 to 5 cm (1 to 2 in) long, either sessile or with short petioles. There are 11 to 19 crowded, somewhat obovate, cuneate leaflets 3 to 10 mm long which are smooth above and pubescent beneath with long hairs.

The flowering stalks are 2 to 3 cm (0.8 to 1.2 in) long and bear 12 to 25 flowers. The flowers are reddish-lilac with the upper petal 9 to 10 mm in length and with the lateral petals nearly as long. The calyx is about 4.5 mm long and pubescent with a mixture of black and white hairs, with the white hairs sometimes predominating.

The pod is curled upwards, sometimes into a nearly complete ring. In cross section it is compressed or sometimes triangular. At maturity it is straw-colored and pubescent with spreading or curly hairs.

This species resembles *A. iodanthus* S. Wats. but differs in that the pubescence is made up of longer (1 to 1.2 mm) fine hairs, compared to *A. iodanthus* which has hairs no longer than 0.7 mm. Typically, *A. iodanthus* has a relatively simpler branching pattern. *A. pseudiodanthus* has a distinctive prostrate, abruptly zigzag stems.

Flowering in May and June.

HABITAT: Dunes and sandy flats. Associated plants: *Sarcobatus vermiculatus*, *Grayia spinosa*, *Tetradymia glabrata*, *Hilaria jamesii*, *Oryzopsis hymenoides*, *Astragalus lentiginosus* var. *fremontii*, *Atriplex confertifolia*, and *Sphaeralcea ambigua*. Elevation: 1525-2075 m (5000-6800 ft).

KNOWN DISTRIBUTION: Esmeralda, Mineral, and Nye counties, Nevada. Mono County, California.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Early season grazing. Proposed MX system.

REMARKS: None.

ASTRAGALUS PTEROCARPUS

From King
(1871)

ASTRAGALUS PTEROCARPUS S. Wats.
Winged Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus pterocarpus* S. Watson, "Botany," p. 71. *In:* C. King, Report of the geological explorations of the Fortieth Parallel. Vol. 5. 1871. Type: Watson, near the junction of Reese River with the Humboldt, Nevada, August 1868. The specific name, *pterocarpus*, and the common name refer to the winged pods of this species.

DESCRIPTION: A perennial with sparsely leafy sedgelike or wiry stems to 3.5 dm (14 in) long. The leaves are 5 to 10 cm (2 to 4 in) long and bear one to three pairs of very narrow, linear leaflets which are silvery pubescent above and sparsely pubescent below.

The inflorescence stalk is 5 to 11 cm (2 to 4.4 in) long with 5 to 15 purplish flowers with an upper petal which reaches 19 mm in length. The calyx is 9 to 12 mm long and pubescent with black or mixed black and white hairs.

The large pod is 3 to 4.5 cm (1.2 to 1.8 in) long and strongly compressed with a thin rigid wing along both sides.

The winged pods and very long, narrow leaflets are so distinctive in this species that there is no likelihood of confusing it with any other *Astragalus* found in the area.

Flowering from April to June.

HABITAT: Low-gullied hills and saline, sandy flats. Associated plants: *Elymus cinereus, Artemisia spinescens, Sitanion hystrix, Sarcobatus vermiculatus, Sphaeralcea grossulariaefolia, Tetradymia glabrata, Distichlis spicata* var. *stricta,* and *Suaeda* sp. Elevation: 1220-1410 m (4000-4620 ft).

KNOWN DISTRIBUTION: Humboldt, Pershing, and Lander counties, Nevada.

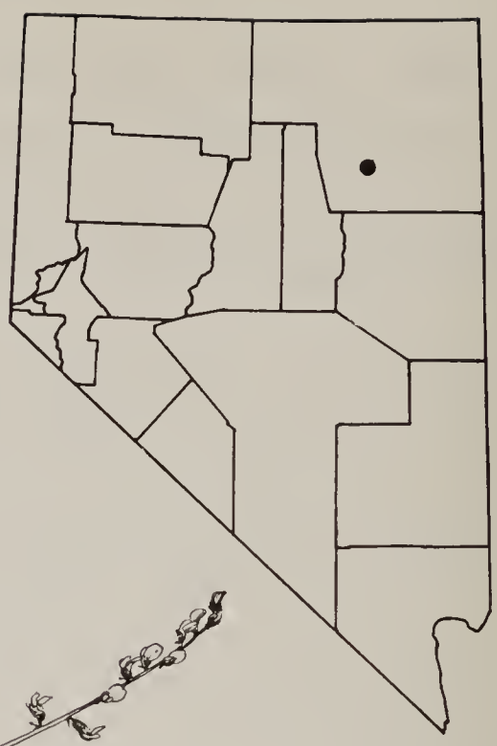
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

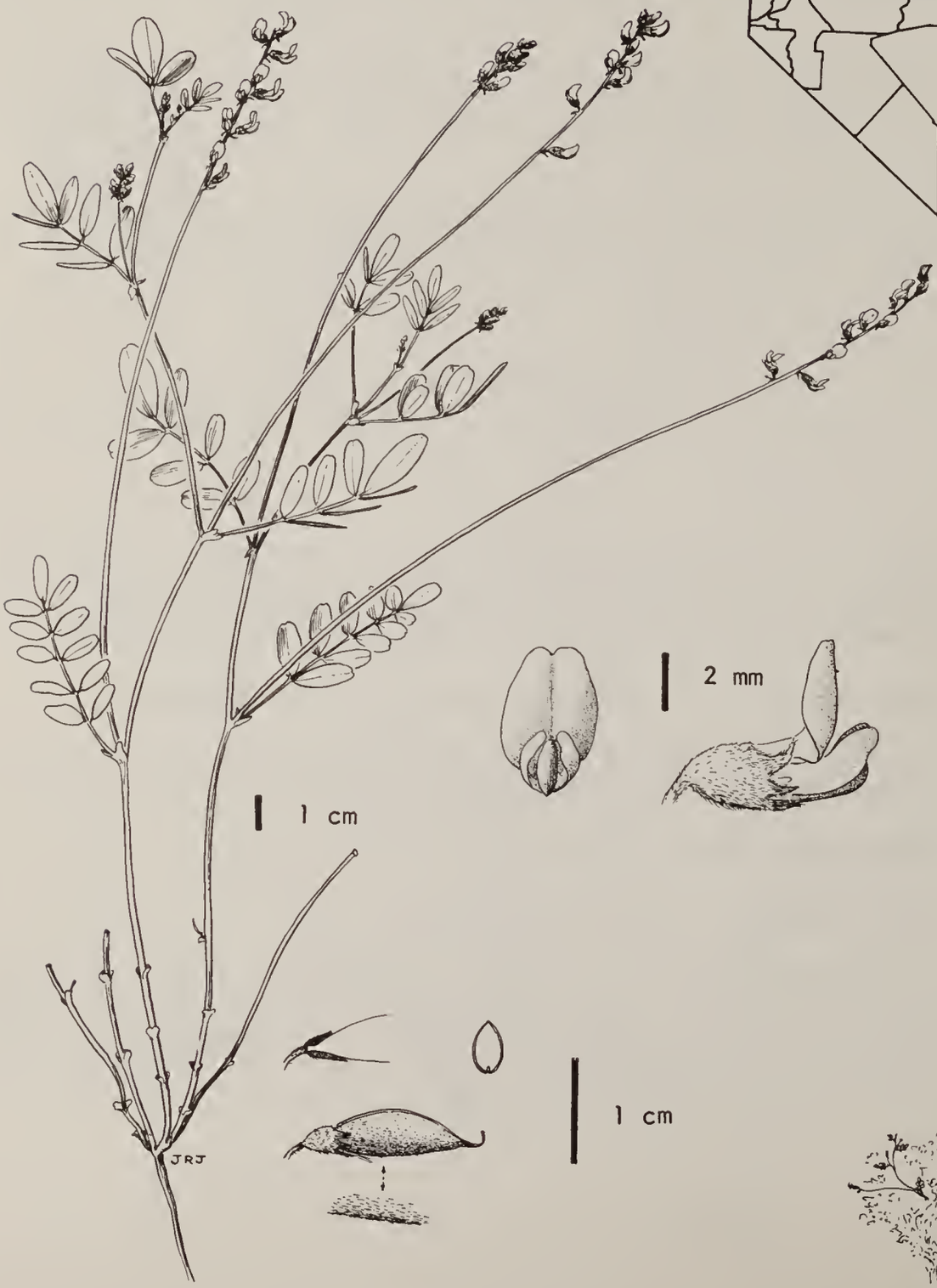
LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: Recently, new populations of *Astragalus pterocarpus* have been located which have extended its range considerably. Many of these are in remote areas where there are few threats. Grazing does not appear to be a threat. Unless the MX system seriously impacts this taxon, it will not require protected status.

ASTRAGALUS ROBBINSII var. OCCIDENTALIS





ASTRAGALUS ROBBINSII (Oakes) Gray var. OCCIDENTALIS S. Wats.
Lamoille Canyon Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus robbinsii* var. *occidentalis* S. Watson, "Botany," p. 70. *In*: C. King, Report of the geological explorations of the Fortieth Parallel. Vol. 5. 1871. Type: Watson, East Humboldt Mountains, Nevada, 10,000 ft, 13 August 1868. Modern-day collections have all been from Lamoille Canyon, Ruby Mountains.

DESCRIPTION: A very slender, weak, and diffuse perennial with stems 1.5 to 4.5 dm (6 to 18 in) long, with 4 to 9.5 cm (1.6 to 3.8 in) long leaves bearing 7 to 11 leaflets which are pubescent beneath with somewhat appressed hairs.

The few-flowered inflorescence bears only 6 to 12 flowers, somewhat remote from one another, and having lilac petals. The upper petal is about 7.4 mm long, while the calyx attains a length up to 4.6 mm.

The pods have a short stalk, 0.5 to 1.4 mm long, and attain a length of 1 to 1.5 cm and a width of 4 to 5 mm. They may be somewhat flattened at right angles to the line along which splitting eventually occurs. There is a short beak 0.8 to 1.2 mm long. The pods are pubescent with somewhat appressed hairs.

This taxon can be separated from the similar appearing *Astragalus alpinus* L. by the latter's 15 to 25 leaflets and pods which are triangular in cross-section and strongly grooved on the lower side.

Flowering in July and August.

HABITAT: Moist loamy soil, stream-side, or sheltered under shrubs and trees. Associated plants: *Populus tremuloides*, *Salix* sp., *Geranium viscosissimum*, *Apocynum androsaemifolium*, *Potentilla fruticosa*, *P. glandulosa*, *Thalictrum fendleri*, and *Carex* sp. Elevation: 2285-3050 m (7500-10,000 ft).

KNOWN DISTRIBUTION: Elko County, Nevada.

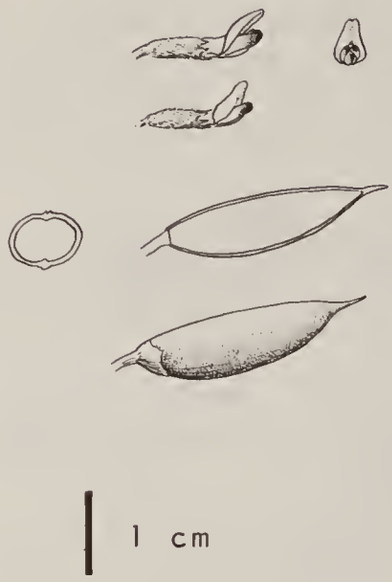
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); threatened (Reno T/E Workshop, 2 Nov 1979); endangered (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: USFS.

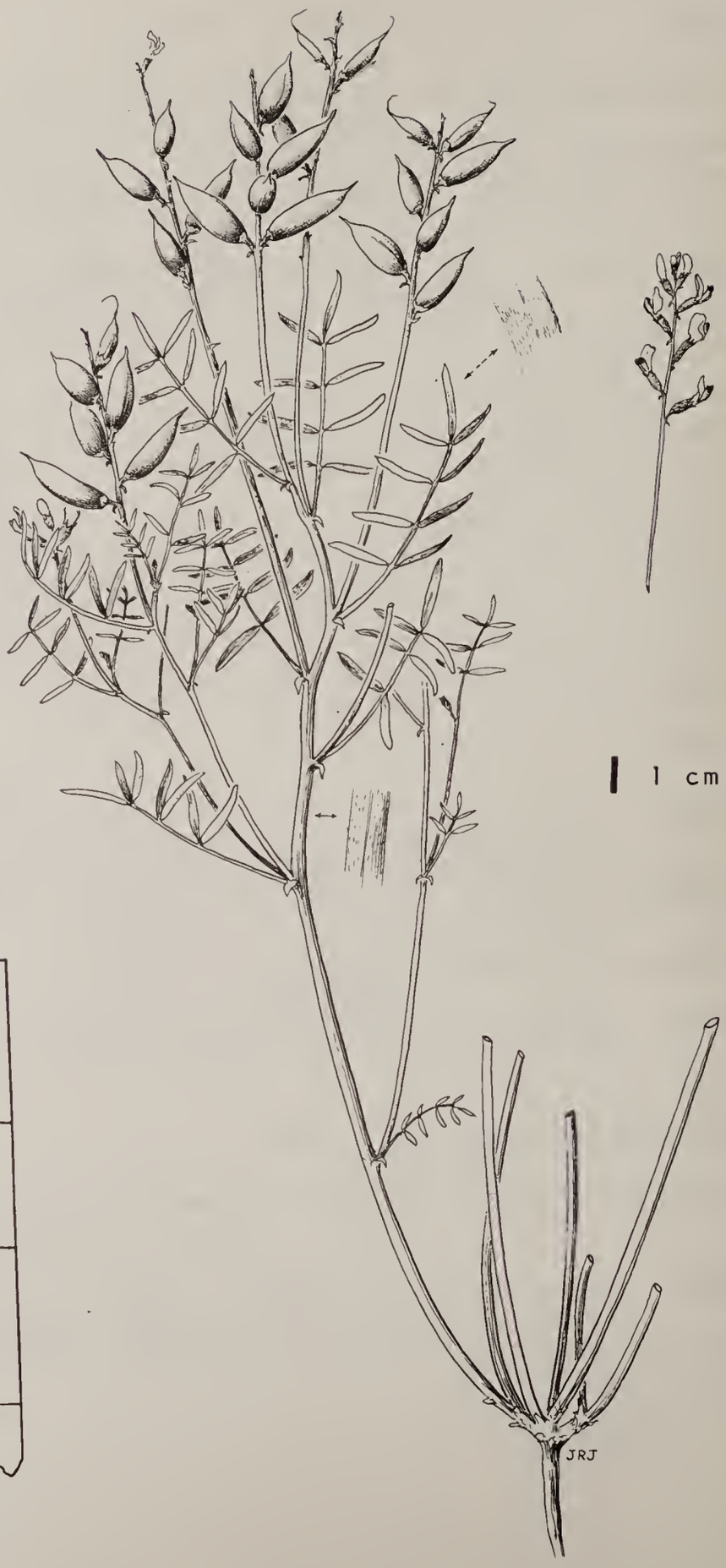
EXISTING OR POTENTIAL THREATS: Recreational use of the known sites. Grazing by sheep. Proposed MX system (indirectly).

REMARKS: The impact will increase in Lamoille Canyon if the MX system becomes a reality. Mozingo and Williams recommend endangered status until new populations are found or the USFS takes steps to preserve the habitat.

ASTRAGALUS SERENOI var. SORDESCENS



1 cm



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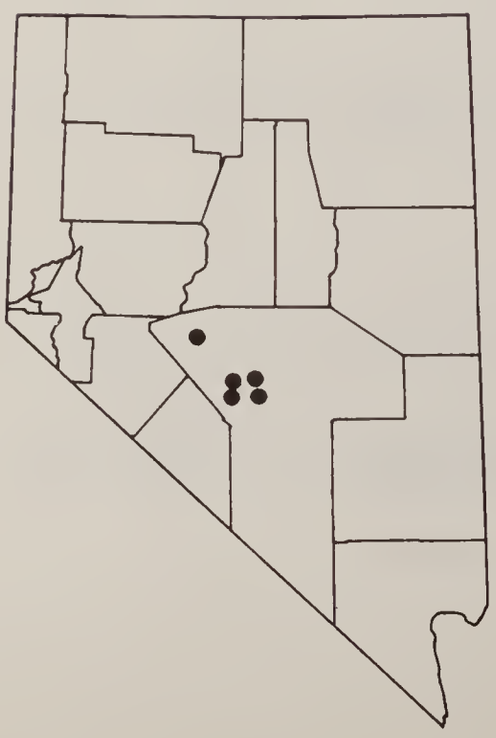


ASTRAGALUS SERENOI (O. Kze.) Sheld. var. SORDESCENS Barneby
Squalid Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus serenoi* var. *sordescens* Barneby, Leaflets of Western Botany, 7:195. 1954. Type: Ripley and Barneby, foothills of the Toquima Range, Nye County, 6800 ft. The common name and the varietal name, *sordescens*, refer to the flower color.

DESCRIPTION: A tall, bushy perennial with stems up to 4.5 dm (18 in) tall. The leaves are 5 to 15 cm (2 to 6 in) long with 5 to 11 very narrow leaflets from 5 to 30 mm long, which are finely silvery pubescent above.

The flower stalks are stout, erect and 10 to 25 cm (4 to 10 in) long and bear 7 to 25 distantly placed flowers at the upper end. The flowers are dull, yellowish white with purplish tips on the lateral petals. The calyx is 8 to 10 mm long, and the larger upper petal varies from 14.5 to 16 mm long.

The pod is 1.5 to 2.2 cm long and only slightly curved. In cross-section it is nearly circular.

Astragalus serenoi var. *serenoi* differs from this variety in that the former has purple flowers with white tips to the lateral petals. Additionally, the pods of var. *serenoi* are broadest at the middle and have a partial partition while those of var. *sordescens* have virtually no partition and are broadest below the middle.

Flowering in May and June.

HABITAT: Gentle gravelly slopes and washes. Associated plants: pinyon-juniper, *Artemisia spinescens*, *Atriplex confertifolia*, *Tetradymia glabrata*, *Sarcobatus vermiculatus*, and *Ephedra nevadensis*; this *Astragalus* often grows up through plants of *Artemisia nova*. Elevation: 1860-2075 m (6100-6800 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 25 February 1978); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, USFS, and possibly private.

EXISTING OR POTENTIAL THREATS: Mining activity. Grazing. Proposed MX system.

REMARKS: Collections during the summer of 1978 extended the range of this taxon considerably. However, it is often very scarce at any one location. More exploration should be done to determine the full range of this taxon.

ASTRAGALUS SOLITARIUS

ASTRAGALUS SOLITARIUS Peck
Solitary Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus solitarius* Peck, Leaflets of Western Botany, 4:181. 1945. Type: Peck, Malheur County, Oregon, 4 June 1943. The specific name, *solitarius*, apparently refers to the fact that the plant has a single or at best a few stems.

DESCRIPTION: A tall, slender, wiry, and sparsely leafy perennial, grayish pubescent throughout with short hairs reaching 0.3 mm in length. The leaves are 2 to 7 cm (0.8 to 2.8 in) long and bear only five to nine linear, pubescent leaflets 3 to 15 mm long.

The inflorescence stalks are 5 to 15 cm (2 to 6 in) long and bear 7 to 30 loosely arranged pale lilac flowers. The calyx is about 3 mm long and pubescent with white or sometimes partially black hairs. The large upper petal is 6.3 to 8 mm long, while the lateral petals may be slightly longer.

The pod is borne on a slender stalk 4 to 8 mm long and is itself 1.2 to 2.5 cm long and 3 to 4 mm wide. The thin, papery valves of the pod are rather densely pubescent.

This species can be separated from the similar appearing and common *A. filipes* Torr. by the former's more abundant pubescence, and narrower pods which are densely pubescent rather than smooth or rarely lightly pubescent as are those of *A. filipes*.

Flowering from May to early June.

HABITAT: Plains and low gullied hills, in sandy-clay soils. Associated plants: nearly always taking shelter under and often intricately entangled in low sagebrush; *Sarcobatus vermiculatus, Grayia spinosa, Atriplex confertifolia,* and *Tetradymia glabrata*. Elevation: 1160-1400 m (3800-4600 ft).

KNOWN DISTRIBUTION: Humboldt County, Nevada. Oregon.

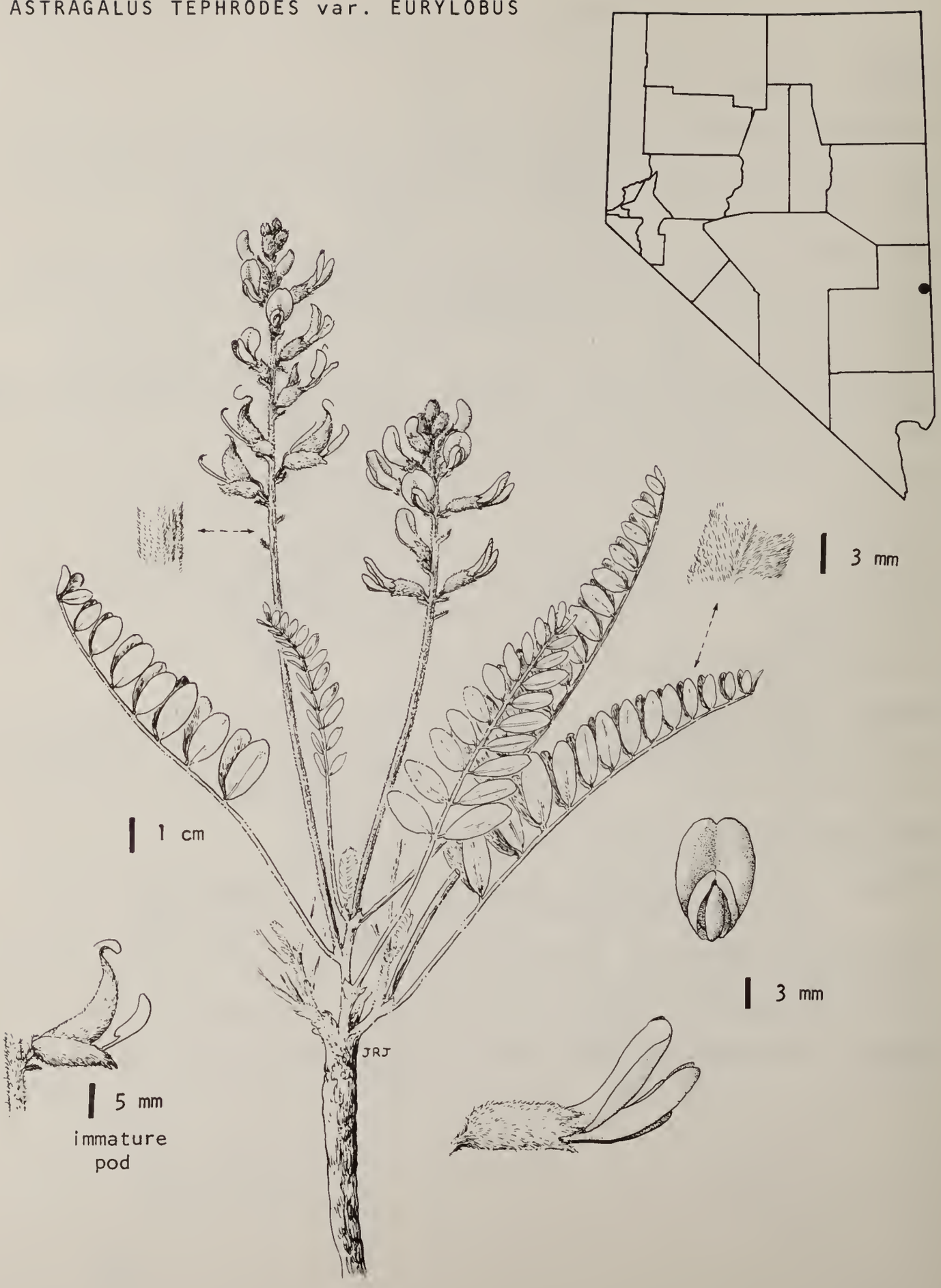
STATUS: Threatened (1975 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: BLM and possibly private.

EXISTING OR POTENTIAL THREATS: Mining activity. Chaining of sagebrush.

REMARKS: This taxon should be searched for to determine its full range.

ASTRAGALUS TEPHRODES var. EURYLOBUS



ASTRAGALUS TEPHRODES Gray var. EURYLOBUS Barneby
Peck Station Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus tephrodes* var. *eurylobus* Barneby, Memoirs of the New York Botanic Garden, 13:643. 1964. Type: Ripley and Barneby, Needle Mountains, E of Peck Station, Lincoln County, NV, 4950 ft, 18 June 1944. The specific name, *tephrodes*, means ash-gray; the varietal name, *eurylobus*, refers to the broad pod of this plant.

DESCRIPTION: A stout perennial with grayish pubescent leaves 10 to 24 cm (4 to 9.6 in) long borne on angular stems 2 to 9 cm (0.8 to 3.6 in) in length. The leaves have 21 to 27 rather broad flat leaflets 7 to 27 mm long.

The inflorescence stalk is 10 to 18 cm (4 to 7 in) long and bears 18 to 26 flowers whitish to purplish in color. The calyx is about 12 mm long, and the large upper petal of the flower may reach 22 mm in length.

The broad pod is 2.5 to 4 cm (1 to 1.6 in) long and 1 to 1.6 cm wide, with a beak 5 to 10 mm long. The woody valves of the pod have a wrinkled appearance and are strongly pubescent. (The drawing was taken from a very immature pod.)

The related and widespread var. *brachylobus* (Gray) Barneby of the same species can be separated by its pods which are only half as large at maturity and by its lesser amount of pubescence.

Flowering from April to June.

HABITAT: On saddles and along gullied draws in low alkaline sandy-clay hills; weathered pink sandstone knolls. Associated plants: not known. Elevation: 1420-1510 (4650-4950 ft).

KNOWN DISTRIBUTION: Lincoln County, Nevada.

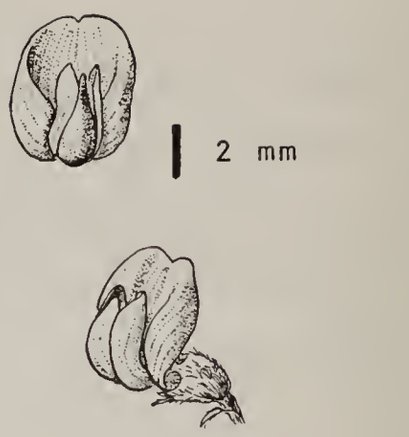
STATUS: Endangered (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

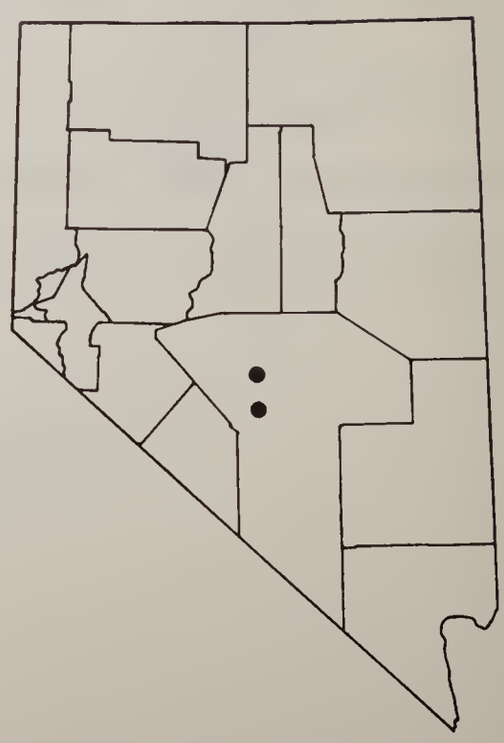
LAND OWNERSHIP/MANAGEMENT: BLM.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: This taxon is only known from the original collection by Ripley and Barneby. A concerted effort should be made to relocate it.

ASTRAGALUS TOQUIMANUS





ASTRAGALUS TOQUIMANUS Barneby
Toquima Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus toquimanus* Barneby, Leaflets of Western Botany, 3:111. 1942. Type: Ripley and Barneby, in the Toquima Range, east of Manhattan, Nye County, Nevada, 7000 ft, 1 June 1941. The common name and the specific name, *toquimanus*, are both taken from the range where the type was collected.

DESCRIPTION: A slender, wiry perennial, pubescent throughout with fine appressed hairs. The several to numerous stems arise from the root-stalk and are 7 to 25 cm (2.8 to 10 in) long, and are purplish at the base. The leaves are 4 to 11 cm long with 9 to 17 somewhat narrow to relatively broad leaflets, 3 to 15 mm long, which are mostly folded and arched backward and are either obtuse or notched at the tip.

The flower stalks are 2.5 to 6 cm (1 to 2.4 in) long and bear 9 to 20 loosely arranged yellowish-white flowers which are veined and suffused with dull lilac. The calyx is 3.4 to 4 mm long, and pubescent with short black and white appressed hairs.

The pods are pendulous, somewhat incurved, between 1.8 to 2.5 cm (0.7 to 1 in) long and 3.5 to 4.5 mm in diameter, and are sharply triangular in cross-section.

From *Astragalus howellii* Gray which has similar pods this species may be distinguished by its fewer leaflets (9 to 17 as opposed to 21 to 27), appressed pubescence, and dingy purple flowers. From the similar fruited *A. misellus* S. Wats., *A. toquimanus* may be separated by its more erect habit, appressed pubescence, and smooth, mottled pods.

Flowering in May and June.

HABITAT: Gravelly hillsides and benches in calcareous soils. Associated plants: pinyon-juniper, *Atriplex confertifolia, Grayia spinosa, Astragalus serenoi* var. *sordescens*, often intertwined in low sagebrush. Elevation: 1890-2105 m (6200-6900 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

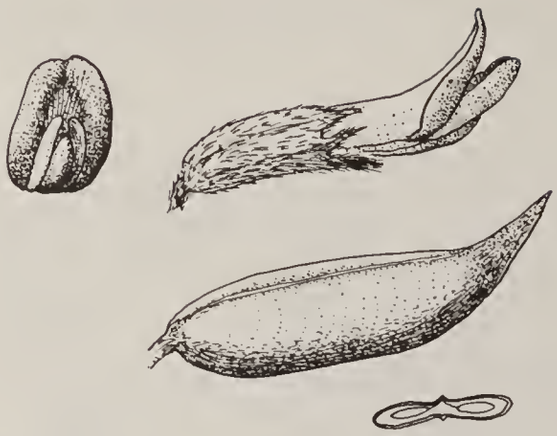
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, USFS, and possibly private.

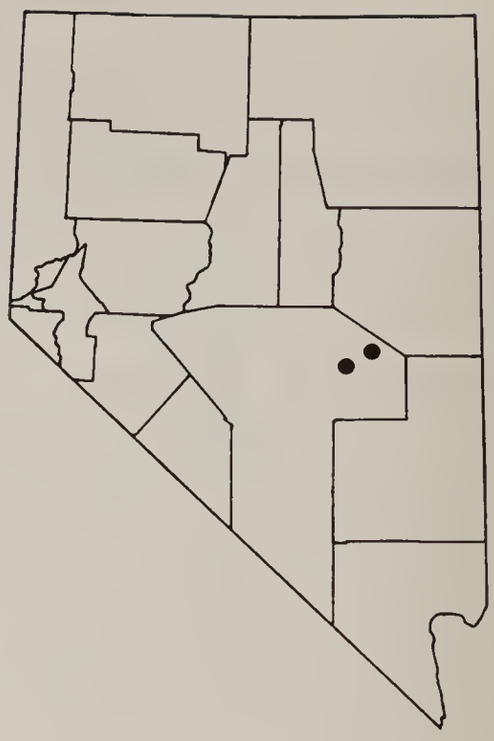
EXISTING OR POTENTIAL THREATS: Mining activity. Grazing. Proposed MX system.

REMARKS: This taxon is known from several sites, but it is not abundant at any of them. A search should be made for more populations of this taxon. It is not always easy to spot because it grows up through sagebrush and is partly hidden by it.

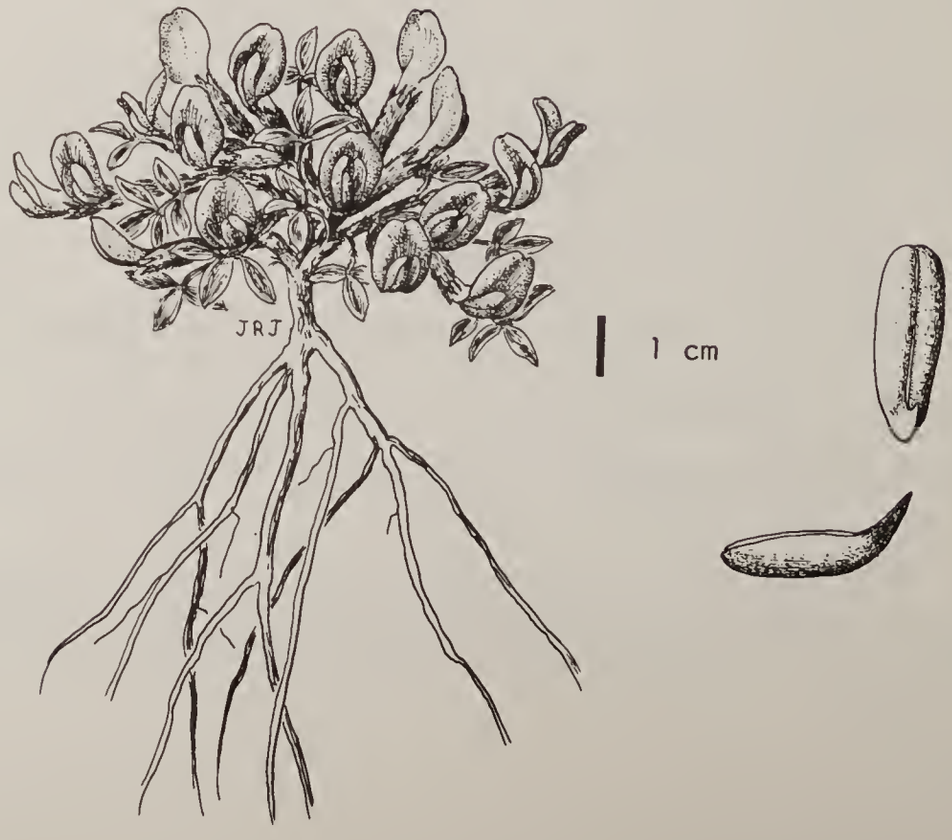
ASTRAGALUS UNCIALIS



1 cm



1 cm



1 cm

ASTRAGALUS UNCIALIS Barneby
Currant Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus uncialis* Barneby, Leaflets of Western Botany, 3:101. 1942. Type: Ripley and Barneby, northeastern Nye County, Nevada, 5300 ft, 22 May 1941. The type was collected near Currant. The specific name, *uncialis*, meaning inch-high, refers to the size of the plants.

DESCRIPTION: A small, densely tufted perennial with silvery-pubescent leaves 1.5 to 7.5 cm (0.6 to 3 in) long on slender wiry petioles. The leaflets vary from oblanceolate to elliptic to narrow obovate in shape. The stipules are pale and thin with a green midrib and are 3 to 6.5 mm long.

The main flower stalks are leafless and shorter than the leaves and bear 1 to 3 disproportionately large, long, narrow, purple flowers. The large upper petal is curved backwards and is up to 32 mm long. The calyx is 12 to 16 mm long and whitish pubescent with sometimes a few black hairs.

The pod is very strongly compressed at right angles to the line along which it eventually splits and has an upwardly curved beak. At maturity it is straw-colored or brown with a coat of silvery pubescence.

The few-foliate leaves, silvery aspect, dwarf size, and disproportionately large flowers readily distinguish this species from any others likely to be found in the same locale.

Flowering in May.

HABITAT: Dry knolls and slopes, saline sand or gravel derived from limestone. Associated plants: *Atriplex confertifolia, Sarcobatus baileyi, Artemisia spinescens, Kochia americana, Ephedra viridis, Hilaria jamesii, Lepidium montanum,* and *Tetradymia* sp. Elevation: 1615-1845 m (5300-6050 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

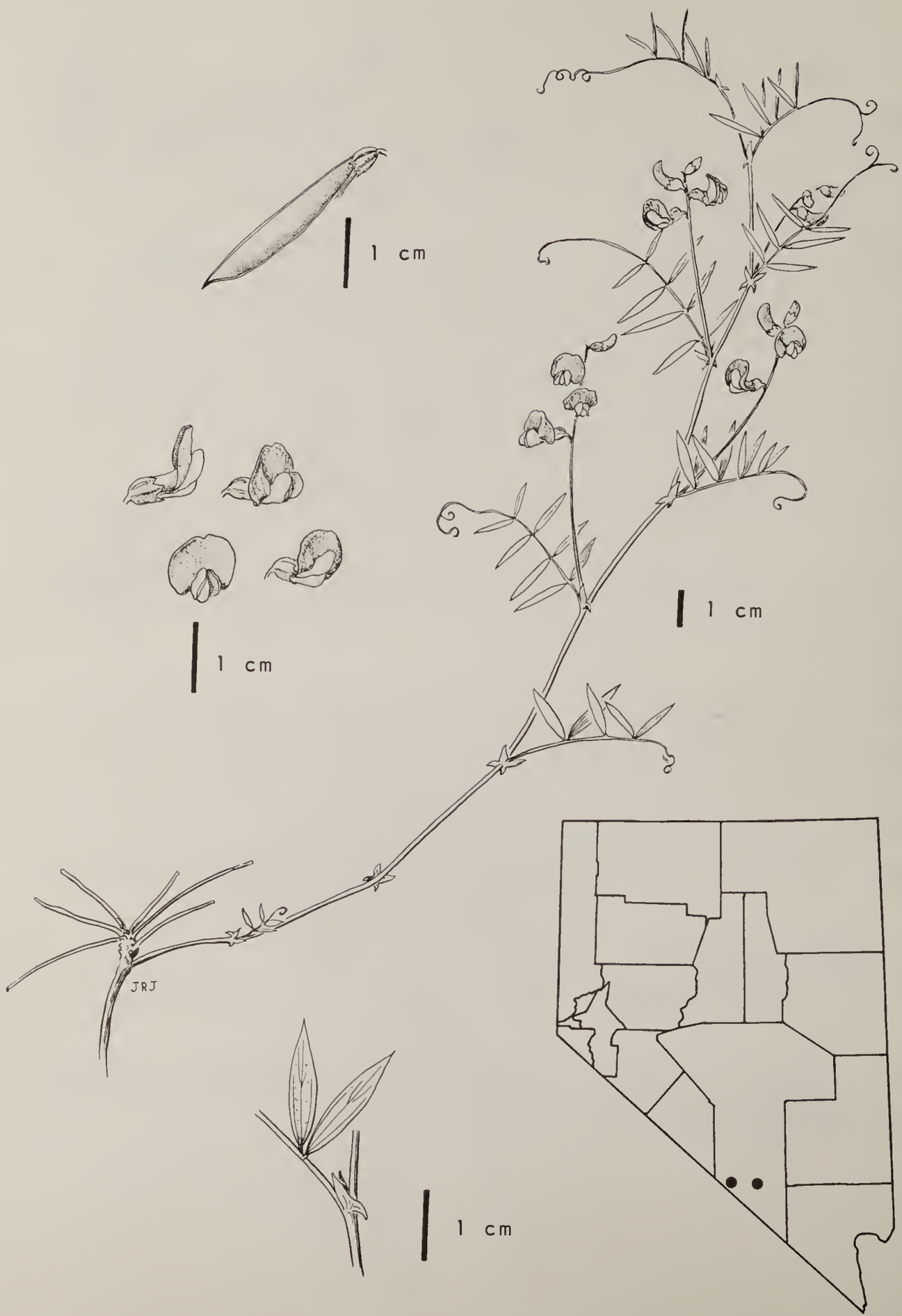
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and possibly private.

EXISTING OR POTENTIAL THREATS: Mineral exploration. Drilling for oil. Proposed MX system.

REMARKS: *Astragalus uncialis* is only known from a limited area. Because it is such a diminutive plant, it is not easy to spot. It should be searched for in similar habitats in the same area.

LATHYRUS HITCHCOCKIANUS



LATHYRUS HITCHCOCKIANUS Barneby & Reveal
Mojave Sweet Pea

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Lathyrus hitchcockianus* Barneby & Reveal, Aliso, 7: 362. 1971. Type: Reveal, central Bullfrog Hills, Nye County, Nevada, 1380 m, 4 May 1970. This species is named for C. Leo Hitchcock and is the only known *Lathyrus* in the Mojave Desert.

DESCRIPTION: A bluish-green, diffuse, perennial herb sparsely pubescent with weak tapering hairs up to 0.5 mm long. The stems are prominently ribbed, up to 3.5 dm (14 in) long and bear leaves which are 3 to 7 cm (1.2 to 2.8 in) long including the tendril which is 2 to 3 forked and longer than the last pair of leaflets. The leaflets are narrowly lanceolate to linear tapering and are mostly in 2 or 3 pairs.

The flower stalks bear 1 to 4 lilac-purple flowers, with a broad upper petal 10 to 11 mm long and 8 to 9 mm wide. The calyx is about 4 to 5 mm long with 5 prominent ribs. The pod is 2.5 to 3 cm (1 to 1.2 in) long and varies from light green to dark green or greenish-black.

Lathyrus lanswertii Kell. ssp. *aridus* (Piper) Brads. closely resembles this species but does not occur in the Mojave Desert. Moreover, ssp. *aridus* has short, simple and usually bristle-like tendrils, and the flowers are paler and borne on much longer individual pedicels.

Flowering in April and May.

HABITAT: Washes and canyon bottoms in rocky volcanic gravelly or sandy soil. Associated plants: *Salvia dorrii* ssp. *gilmanii*, *Purshia glandulosa*, *Ephedra viridis*, *Grayia spinosa*, *Atriplex confertifolia*, or *Lycium pallidum* var. *oligospermum*; this *Lathyrus* often grows in tangled association with a shrub. Elevation: 1370-1585 m (4500-5200 ft).

KNOWN DISTRIBUTION: Nye County, Nevada. Inyo County, California.

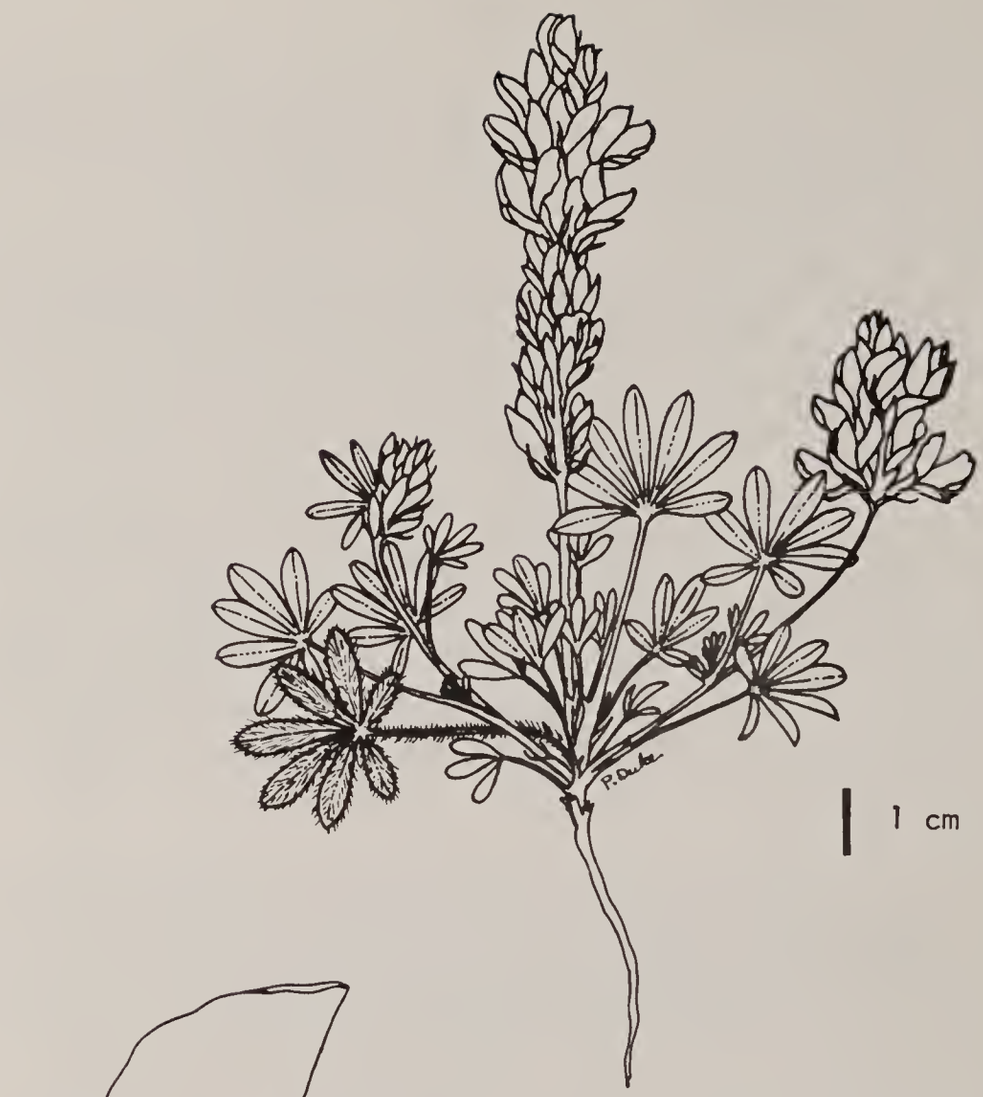
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

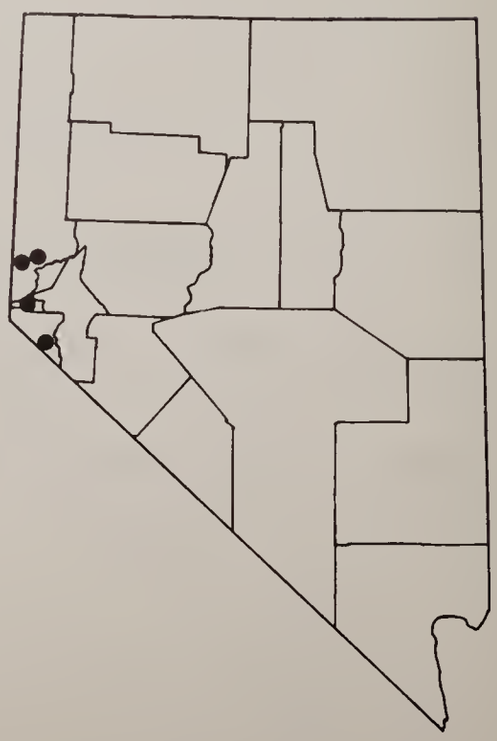
LAND OWNERSHIP/MANAGEMENT: BLM, DOE (Nevada Test Site), National Park Service, and private.

EXISTING OR POTENTIAL THREATS: Drilling or construction work. Mining activity. Proposed MX system.

REMARKS: Mining activity is greatly increasing.

LUPINUS MALACOPHYLLUS





LUPINUS MALACOPHYLLUS Greene
Soft Leaf Lupine

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Lupinus malacophyllus* Greene, Pittonia, 1:215. 1888. Type: Sonne, near Verdi, Washoe County, Nevada. 2 May 1888. The specific name, *malacophyllus*, describes the leaves which are soft to the touch.

DESCRIPTION: An erect annual to 15 cm (6 in) high and rough-hairy throughout. There are five to seven oblanceolate leaflets on petioles 2 to 4 cm (0.8 to 1.6 in) long.

The flowering stalks are 5 cm (2 in) long with the individual flowers borne compactly in 3 to 9 whorled clusters. The white to yellowish flowers are 11 to 14 mm long. The upper lip of the calyx is slightly swollen at the base.

There are generally two seeds produced in the 6 mm wide pods.

Although the flowers may occasionally have a bluish tinge this species may be easily distinguished from *Lupinus bicolor* Lindl. which has blue and white flowers by the former's completely hairless lower petal or "keel," contrasted with the latter's hairy edges on the upper part of the keel. From *L. brevicaulis* S. Wats. this species may be separated by flowers which are borne in whorls rather than a compact cluster as are the latter's.

Flowering from April to June.

HABITAT: Rocky hillsides, sandy flats. Associated plants: *Artemisia tridentata, Castilleja chromosa, Layia glandulosa, Blepharipappus scaber,* and *Eriogonum* spp. Elevation: 1370-1615 m (4500-5300 ft).

KNOWN DISTRIBUTION: Carson City, Douglas, and Washoe counties, Nevada.

STATUS: Threatened (Reno T/E Workshop, 9 Feb 1979); watch list (2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Urban expansion.

REMARKS: This lupine was originally thought to be very restricted in its range, but now it is known from more locations. In favorable years it is locally abundant.

TRIFOLIUM LEMMONII

TRIFOLIUM LEMMONII S. Wats.
Lemmon Clover

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Trifolium lemmonii* S. Watson, Proceedings of the American Academy of Arts and Sciences, 11:127. 1876. Type: Lemmon, Sierra Co., California, 5300 ft, 1873. This taxon is named for J.G. Lemmon who collected the type specimen.

DESCRIPTION: A perennial reaching 2 dm (8 in) in height and clothed with a pubescence consisting of sharp, stiff, appressed hairs, sparsely so on the stems but densely so on the leaflets. The leaves are composed of three to five obovate, elliptic or rounded leaflets with petioles 3 to 5 times as long as the 0.9 to 1.9 cm leaflets. The stipules are similarly pubescent, with the lower ones to 1 cm long and fused with petioles for two-thirds of their length.

The somewhat globose flower cluster is supported on stalks 1 to 1.5 dm (4 to 6 in) long. The flower clusters consist of 15 to 30 pinkish-white flowers with the upper petal 1 to 1.2 cm long. Two manuals for this area characterize the flowers as "yellow" or "bright yellow," this is undoubtedly an error, since neither a recent monograph or the original description so describe them. The pubescent calyx is about 4 mm long with the teeth slightly longer than the fused base.

The 3 to 5, sometimes 7 leaflets, pubescent calyx and pinkish-white flowers immediately distinguish this species from any other perennial clover found in the same area. The similar *Trifolium gymnocarpon* Nutt. has leaflets that are fine-toothed along the edge instead of coarse-toothed as in *T. lemmonii*. Additionally, the latter has a calyx curved at the base, whereas *T. gymnocarpon* has a straight calyx. *T. andersonii* Gray is somewhat similar but is silky-pubescent and has larger flower clusters and leaflets which are entire rather than coarsely toothed as in *T. lemmonii*.

Flowering in May and June.

HABITAT: Dry rocky soil, hillsides. Associated plants: *Artemisia tridentata, Purshia tridentata, Chrysothamnus nauseosus, Tetradymia* sp., and *Pinus jeffreyi*. Elevation: 1615-2010 m (5300-6600 ft).

KNOWN DISTRIBUTION: Washoe County, Nevada. California.

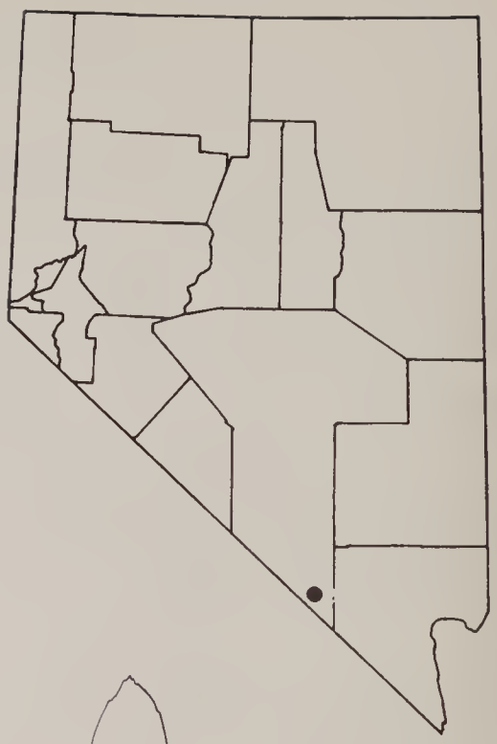
STATUS: Endangered (1975 and 1976 *FR*); threatened (Reno T/E workshop, 2 Nov 1979).

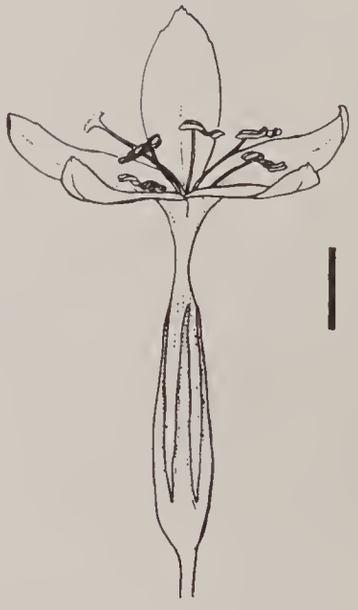
LAND OWNERSHIP/MANAGEMENT: USFS.

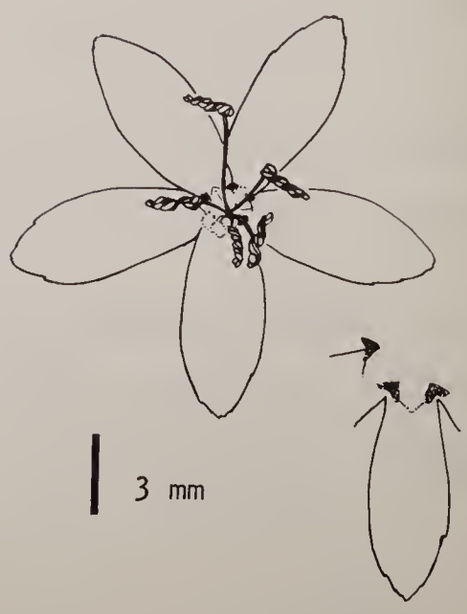
EXISTING OR POTENTIAL THREATS: Logging and wood-cutting.

REMARKS: *Trifolium lemmonii* is rather widely distributed, but it is not abundant at any site in Nevada.

CENTAURIUM NAMOPHILUM







CENTAURIUM NAMOPHILUM Reveal, Broome & Beatley
Spring Loving Centaury

FAMILY: Gentianaceae -- Gentian Family

CITATION AND HISTORY: *Centaurium namophilum* Reveal, Broome & Beatley, Bulletin of the Torrey Botanical Club, 100:353. 1973. Type: Beatley and Reveal, Ash Meadows, Nye County, Nevada, 700 m, 25 July 1972. The specific name, *namophilum*, comes from the Greek, *nama* means spring, and *philos* means loving, describing the habitat.

DESCRIPTION: An erect annual becoming 4.5 dm (18 in) tall. The linear to somewhat wider leaves are borne in opposite pairs on the stem and reach a length of 5 cm (2 in).

There are many flowering branches which bear pink flowers on short (to 9 mm) stalks. There are linear bracts at the base of the tubular calyx. The corolla has a greenish tube 7 to 8 mm long with yellow and white zones at the top where the 7 to 8 mm long petals begin. At the top of the corolla tube on the inside are five dark purple spots. A narrow, linear seed capsule is eventually produced.

This species might be confused with *Centaurium exaltatum* (Griseb.) W. Wight but the former differs in its shorter flower stalks and styles which are 6.5 to 7.5 mm long, over three times longer than those of the latter species.

Flowering from July to September.

HABITAT: Moist to wet clay soils along the banks of streams or in seepage areas. Associated plants: *Grindelia fraxino-pratensis*, *Haplopappus acradenius*, *Distichlis spicata* var. *stricta*, *Fraxinus velutina* var. *coriacea*, and *Prosopis pubescens*. Elevation: 670-1675 m (2200-5500 ft).

KNOWN DISTRIBUTION: Nye County, Nevada. California.

STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

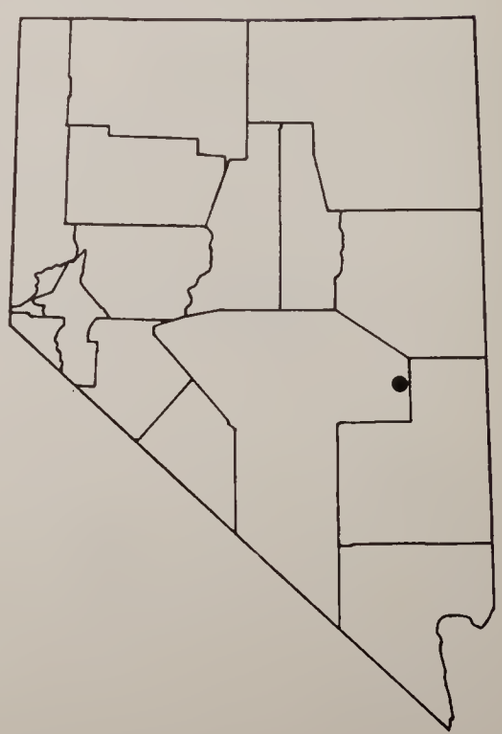
EXISTING OR POTENTIAL THREATS: Utilization of land for agricultural or other developmental purposes; diversion of water for agricultural uses. Proposed MX system (indirectly).

REMARKS: Because this plant has specific edaphic requirements, preservation of its habitat is essential.

FRASERA GYPSICOLA

1 cm

3 mm



FRASERA GYPSICOLA (Barneby) D.M. Post
Sunnyside Green Gentian

FAMILY: Gentianaceae -- Gentian Family

CITATION AND HISTORY: *Frasera gypsicola* (Barneby) D.M. Post, Botanical Gazette, 120:3. 1958. Synonym: *Swertia gypsicola* Barneby, Leaflets of Western Botany, 3:155. 1942. Type: Ripley and Barneby, near Sunnyside, Nye County, Nevada, 4950-5000 ft, 20 July 1941. The specific name, *gypsicola*, refers to the white saline soil on which these plants grow.

DESCRIPTION: A pale green or whitish perennial with a short, wide root-crown from which arise many branches tightly pressed together. The leaves are always opposite, close together, and grass-like, 5 to 9 cm (2 to 3.6 in) long by 1.5 to 2.5 mm wide. The leaves form a depressed mound 1 to 2 dm (4 to 8 in) wide.

The flowering stems have internodes 2 to 3 cm (0.8 to 1.2 in) long. The highest bracts of the inflorescence are ovate, minute, and membrane-margined. Flowers are four-parted on slender pedicels 2 to 12 mm long. The calyx teeth are 4 mm long and 1.5 to 2 mm wide and membrane-margined. The taper-pointed petals are 6 to 6.5 mm long by 2 mm wide, dull or shiny white, and freckled with indigo above the greenish linear-oblong gland on the lower half of the petal.

The mature capsule is oblong and compressed, and 10 to 12 mm (0.4 to 0.5 in) long.

This is a very distinctive *Frasera* and not likely to be confused with any other species in our area. *Frasera albomarginata* S. Wats. is a taller plant and has white margined leaves.

Flowering in June and July.

HABITAT: Fine self-rising soil, encrusted with mineral salts. Associated plants: *Artemisia tridentata, Stanleya pinnata, Frasera albomarginata,* and *Lepidium nanum.* Elevation: 1510-1580 m (4950-5190 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

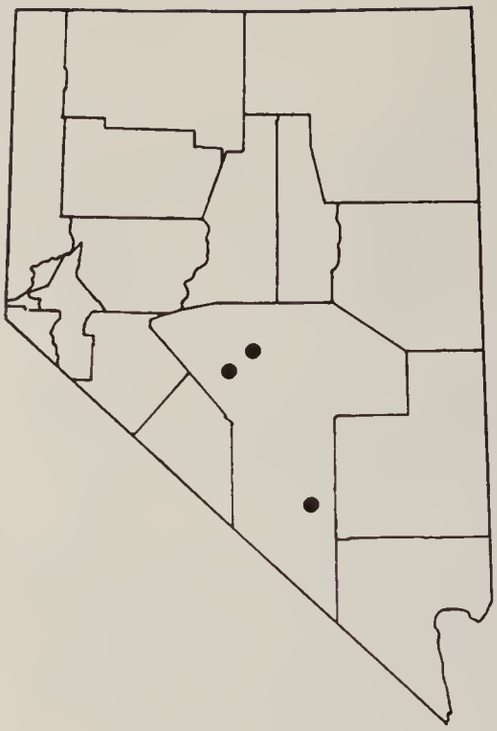
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP/MANAGEMENT: BLM and Nevada Department of Wildlife.

EXISTING OR POTENTIAL THREATS: Off-road vehicles. Proposed MX system.

REMARKS: *Frasera gypsicola* is only known from a single location. Other similar habitats in this area have been searched unsuccessfully for this taxon. The Sunnyside population should be monitored.

FRASERA PAHUTENSIS



5 mm

1 cm

3 mm

FRASERA PAHUTENSIS Reveal
Pahute Green Gentian

FAMILY: Gentianaceae -- Gentian Family

CITATION AND HISTORY: *Frasera pahutensis* Reveal, Bulletin of the Torrey Botanical Club, 98:107. 1971. Type: Beatley and Reveal, Pahute Mesa, Nye County, Nevada, 2195-2230 m, 4 June 1970. Both the specific name, *pahutensis*, and the common name were taken from Pahute Mesa where the type was collected.

DESCRIPTION: A low, spreading herbaceous perennial with a branched woody root-stock system of 5 to 10 branches arising from a woody taproot. The slender stems are 1 to 3 dm (4 to 12 in) long and like the leaves are covered with minute, short soft hairs. The 5 to 10 cm (2 to 4 in) long oblanceolate basal leaves are green except for a 0.2 to 0.3 mm wide white margin. The margin itself is somewhat wavy to scalloped. The opposite stem leaves are narrowly oblanceolate but reduced in size from the basal leaves.

The inflorescence is a narrow, branched system with 2 to 7 whorls of flowers about one-third or less the height of the plant. The calyx has lanceolate lobes 5 to 7 mm long and the greenish-white corolla lobes are 7 to 9 mm long. The glands on the petals are narrowly oblong and 3 to 4 mm long by 0.6 to 0.8 mm wide and covered only at the base.

This species can be distinguished from the closely related *Frasera puberulenta* Davids. by the latter's stout stems (1 or 2 per plant), broad inflorescences comprising the upper half of the plant, a calyx longer than the corolla, and petal glands covered about half their length.

Flowering from May to July.

HABITAT: Gravelly slopes and valley bottoms. Associated plants: *Pinus monophylla*, *Juniperus osteosperma*, *Artemisia tridentata*, *Purshia tridentata*, *Peraphyllum ramosissimum*, and *Ranunculus andersonii*. Elevation: 2195-2410 m (7200-7900 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

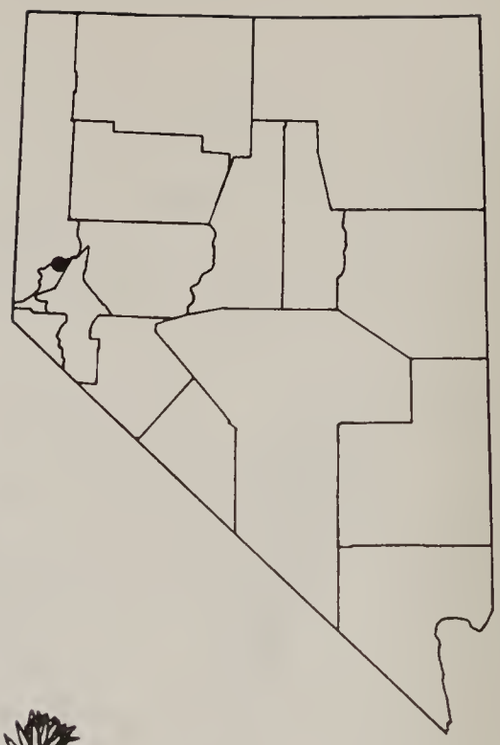
STATUS: Endangered (1975 and 1976 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

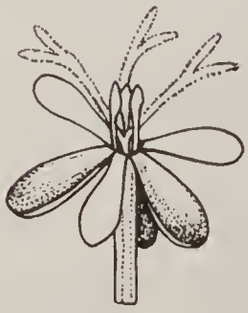
LAND OWNERSHIP/MANAGEMENT: BLM, DOE (Nevada Test Site), USFS, and private.

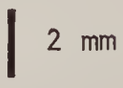
EXISTING OR POTENTIAL THREATS: Grazing by animals. Insect predation. Mining activity. Road construction. Off-road vehicles. Proposed MX system.

REMARKS: In 1978 at one site, few stems remained at flowering time and no seeds were formed. The populations should be monitored to see if this is typical.

ELODEA NEVADENSIS







ELODEA NEVADENSIS St. John
Nevada Waterweed

FAMILY: Hydrocharitaceae -- Waterweed Family

CITATION AND HISTORY: *Elodea nevadensis* St. John, Research Studies of the State College of Washington, 30(2):41. 1962. Type: Tracy and Evans, Wadsworth, Washoe County, NV, 21 July 1887. The specific name, *nevadensis*, apparently refers to the state of Nevada.

DESCRIPTION: A submerged aquatic sparingly branching, with the lower leaves opposite and ovate, but with most leaves in whorls of three and linear-lanceolate. The leaves are 7 to 15 mm long, 1 to 2 mm wide with fine teeth along the edge.

Male and female flowers occur on separate plants and only the female flowers have been seen. The bract at the base of the female flower is 0.9 to 1.1 cm long and cylindric with each flower having a thread-like floral tube 1.5 to 4 cm (0.6 to 1.6 in) long. The three sepals and three petals are about 3 mm long and enclose the stigmas and three sterile stamens (staminodia) which expand into petaloid tips.

This is a dubious or possibly extinct species at best, whose main distinguishing feature is the expanded, petaloid tip of the staminodia. Vegetatively, it resembles *Elodea candensis* Richard which has leaves averaging 2 mm wide, with occasional leaves up to 4 mm wide. From *E. nuttallii* (Planch.) St. John it differs in the former having leaves averaging about 1 mm broad (with a range of 0.5 to 1.5 mm) and a longer, tapering point to the leaf.

Flowering in June and July.

HABITAT: Ponds and streams. Associated plants: *Elodea canadensis*. *Lemna minor*, and *Potamogeton crispus*. Elevation: 1250 m (4100 ft).

KNOWN DISTRIBUTION: Storey and possibly Washoe counties, Nevada.

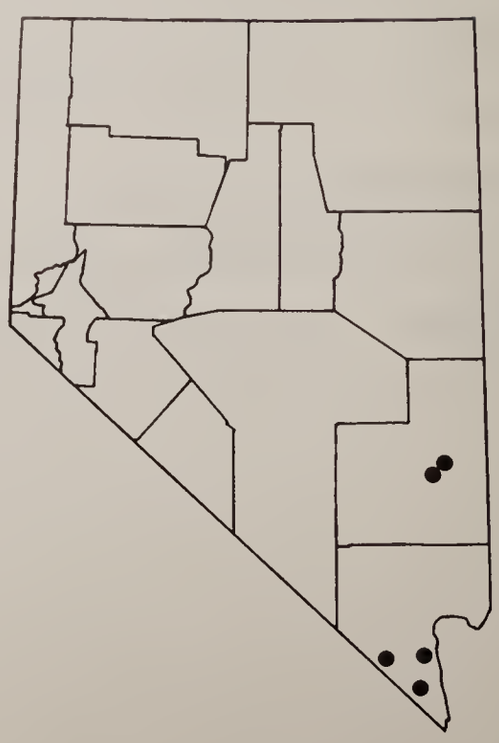
STATUS: Possibly extinct (1975 *FR*); endangered (1976 *FR*); endangered (Reno T/E Workshop, 2 November 1979); possibly extinct (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: Indian Reservation and possibly private.

EXISTING OR POTENTIAL THREATS: Diversion or depletion of the water supply.

REMARKS: This plant was originally found in "ponds near Wadsworth." Apparently these ponds are now dry. This waterweed has been searched for without success.

PHACELIA ANELSONII



PHACELIA ANELSONII J.F. Macbr.
A. Nelson Phacelia

FAMILY: Hydrophyllaceae -- Waterleaf Family

CITATION AND HISTORY: *Phacelia anelsonii* J.F. Macbride, Contributions from the Gray Herbarium, 49:25. 1917. Type: Goodding, Meadow Valley Wash, Lincoln County, NV, 28 April 1902. This species was named in honor of Aven Nelson, the sponsor of many trips for botanical exploration.

DESCRIPTION: A 2 to 4 dm (8 to 16 in) high erect annual with a brownish, glandular pubescence and pinnately parted leaves which are narrowly oblong or spatulate in outline. The 2 to 10 cm (0.8 to 4 in) leaves appear somewhat more glandular pubescent than the stem.

The inflorescence is generally terminal on the main stem and produces short stalked (2 mm) blue or violet flowers that are about 6 mm wide. The oblanceolate and finely pubescent calyx lobes are 3 to 4 mm long and sometimes glandular. The stamens are shorter than the 6 mm long corolla and the style is about the same length as the stamens.

The fruiting capsule is 2.5 to 3 mm long, glandular and finely pubescent at the top.

This species can be separated from the common *Phacelia crenulata* Torr. which it vegetatively resembles by the latter's long stamens which extend beyond the corolla. *P. coerulea* Greene also has short stamens but can be separated by its thinner, purplish stems and seeds which are corrugated rather than simply pitted as in *P. anelsonii*.

Flowering in April and May.

HABITAT: Shaded places in rich soil at the base of sandstone or limestone cliffs or among rocks or in sandy and gravelly washes. Associated plants: *Juniperus osteosperma*, *Salvia dorrii*, and *Quercus turbinella*. Elevation: 760-1525 m (2500-5000 ft).

KNOWN DISTRIBUTION: Clark and Lincoln counties, Nevada. California and Utah.

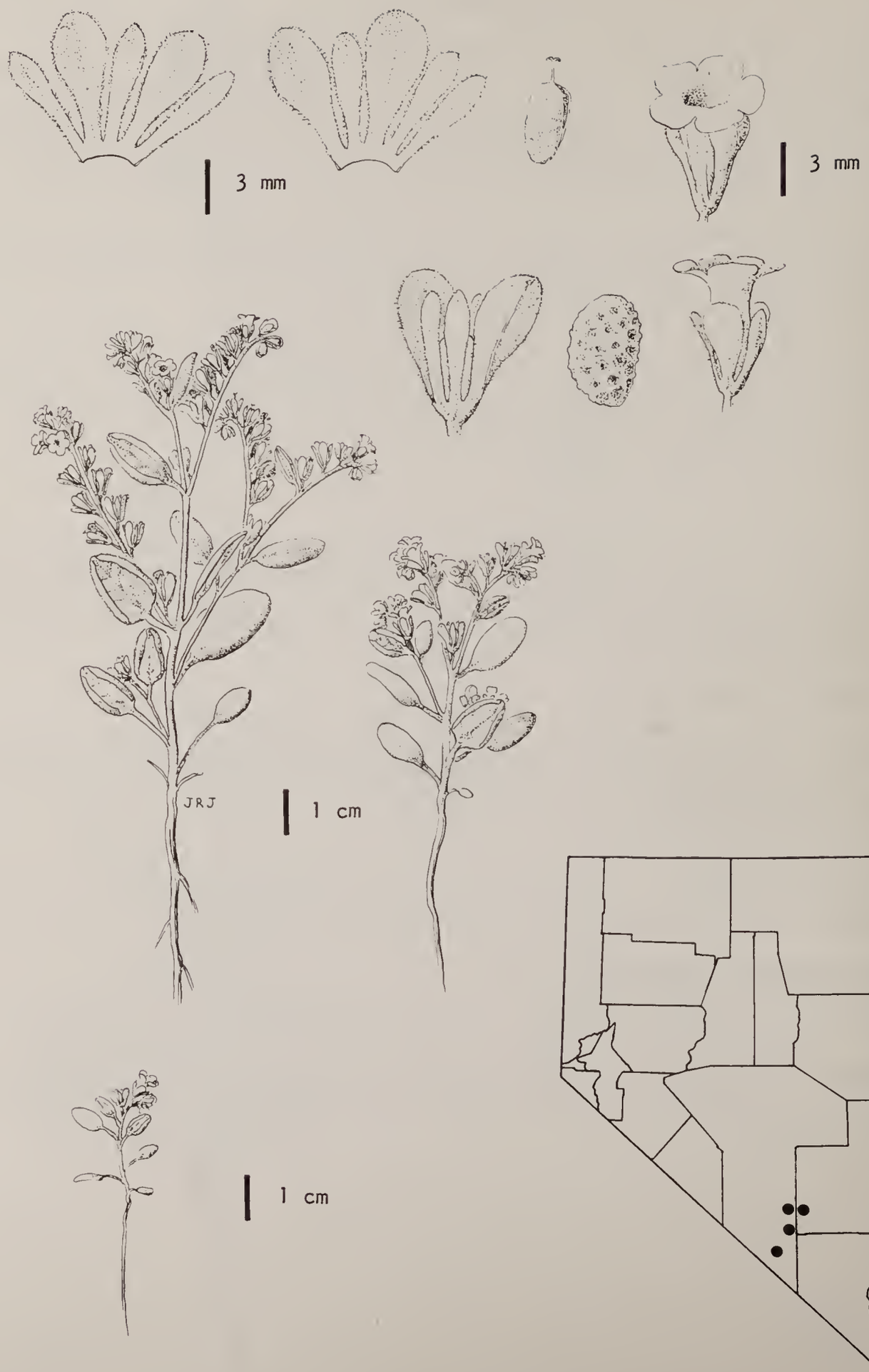
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: Although this species is widely distributed, it is scarce at any one location. The full range and abundance of *Phacelia anelsonii* should be determined.

PHACELIA BEATLEYAE



PHACELIA BEATLEYAE Reveal & Constance
Beatley Phacelia

FAMILY: Hydrophyllaceae -- Waterleaf Family

CITATION AND HISTORY: *Phacelia beatleyae* Reveal & Constance, Brittonia, 24: 199. 1972. Type: Beatley and Reveal, Nevada Test Site, Nye Co., NV, 4000-4500 ft, 29 April 1971. This species was named for Janice C. Beatley who is inseparably identified with the botany of the Nevada Test Site.

DESCRIPTION: An erect, annual herb with one or a few stems reaching a height of 5 to 10 cm (2 to 4 in). The stems are glandular-fine pubescent and bear ovate or elliptical to suborbicular glandular-coarse pubescent leaves 1 to 3 cm (0.4 to 1.2 in) long. The leaf margins, which are nearly entire, are curled toward the underside.

The many flowered coiled inflorescence is 2 to 5 cm (0.8 to 2 in) long, with individual flower stalks 7 to 12 mm long. When the flowers open the sepals are unequal in size and 5 to 8 mm long, but they continue to elongate and become 8 to 10 mm long in fruit. Three of the sepals are narrow oblanceolate while the remaining two are wider and spatulate. The corolla has a yellow tubular base and an upper expanded lavender portion. The stamens are pubescent at the base.

From the similar *Phacelia parishii* A. Gray, this species can be distinguished by the lack of a basal rosette of leaves and leaves which are essentially entire. It differs from *P. pulchella* A. Gray in that the latter has larger purple or violet flowers 7 to 14 mm long and seeds which are brown rather than black.

Flowering in April and May.

HABITAT: Gravel or volcanic tuff; along washes in canyons, or on loose talus, or on steep barren slopes. Associated plants: *Atriplex confertifolia, A. hymenelytra, Larrea tridentata, Ambrosia dumosa, Chrysothamnus viscidiflorus,* and *Coleogyne ramosissima.* Elevation: 1065-1770 m (2500-5800 ft).

KNOWN DISTRIBUTION: Lincoln and Nye counties, Nevada.

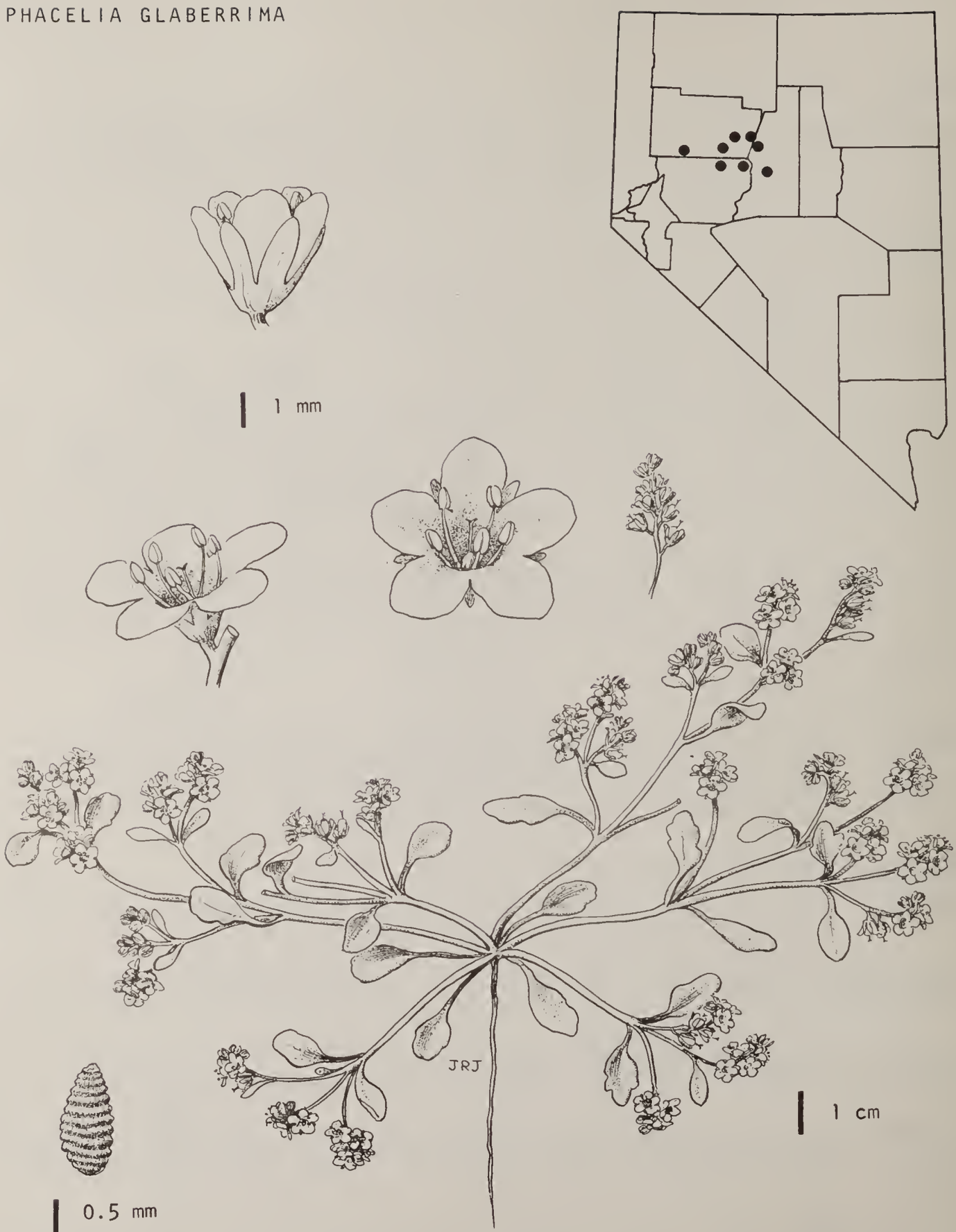
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 25 February 1978); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: DOD (Nellis Air Force Base Bombing and Gunnery Range) DOE (Nevada Test Site), and USFWS.

EXISTING OR POTENTIAL THREATS: Loose substrate. Engineering activities. Some consumption of seeds by wildlife.

REMARKS: This annual appears to be more abundant in favorable years. In some areas it grows on steep, inaccessible slopes which offer it protection.

PHACELIA GLABERRIMA



PHACELIA GLABERRIMA (Torr) J.T. Howell
Smooth Phacelia

FAMILY: Hydrophyllaceae -- Waterleaf Family

CITATION AND HISTORY: *Phacelia glaberrima* (Torr.) J.T. Howell, Leaflets of Western Botany, 4:15. 1944. Synonyms: *Emmenanthe glaberrima* Torrey ex Watson, "Botany," p. 257. *In:* C. King, Report of the geological explorations of the Fortieth Parallel. Vol. 5. 1871. *Miltitzia glaberrima* (Torr.) Brand, Das Pflanzenreich, IV, 251:131. 1913. Type: Watson, Lower Humboldt and Reese River valleys, Nevada 4-5000 ft, May-July, 1868. These plants are smooth, hence the common name and the specific name, *glaberrima*.

DESCRIPTION: An annual plant with several spreading stems up to 20 cm (8 in) long, bearing broadly oblanceolate to elliptic, somewhat succulent and yellowish-green leaves which are entire or with a few coarse teeth. Typically, they are glabrous or else have a few hairs on the margins. The lower leaves have petioles up to 2 cm long and leaf blades to 1.5 cm long.

The inflorescence may attain a length of 8 cm (3.2 in) with short-stalked lemon yellow flowers about 3 to 4 mm long. The calyx segments are very unequal in size and about 2.5 mm long, but becoming 4 to 5 mm when the plant is in fruit with mature capsules of the same length.

From the similar yellow flowered *P. lutea* (Hook. & Arn.) J.T. Howell and *P. scopulina* (A. Nels.) J.T. Howell, *P. glaberrima* may be generally separated by its more open and deeply lobed corolla and glabrous style. Additionally, the former two species are usually not glabrous, although smooth forms do occur.

Flowering in May and June.

HABITAT: Low hills, weathered lacustrine tuff, moist clay soil. Associated plants: *Atriplex confertifolia, A. canescens, Sarcobatus vermiculatus, Cleomella* sp., *Bromus tectorum, Phacelia gymnoclada, P. scopulina,* and scattered *Juniperus osteosperma*. Elevation: 1250-1830 m (4100-6000 ft).

KNOWN DISTRIBUTION: Churchill, Lander, and Pershing counties, Nevada.

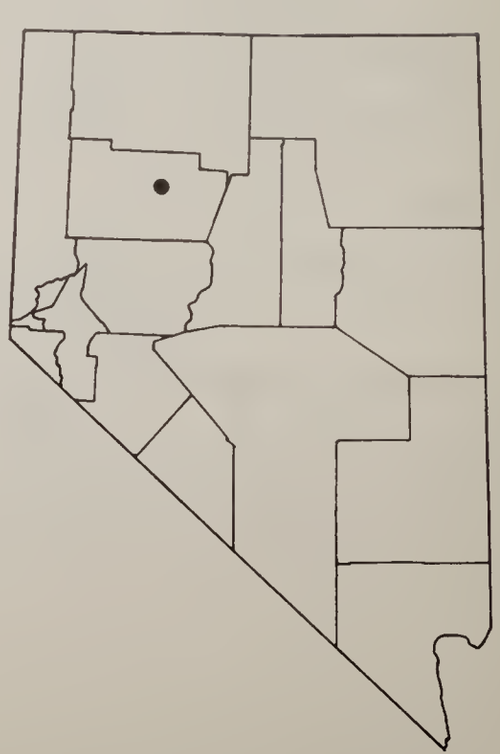
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, US Water and Power Resources Service, and private.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: *Phacelia glaberrima* was rarely collected prior to 1978. Since then, it has been found in several widespread localities. However, since it is an annual its abundance and distribution may be variable. In one area where plants were in great abundance in 1978, none were observed in 1979.

PHACELIA INCONSPICUA



PHACELIA INCONSPICUA Greene
Inconspicuous Phacelia

FAMILY: Hydrophyllaceae -- Waterleaf Family

CITATION AND HISTORY: *Phacelia inconspicua* Greene, Erythea, 3:24. 1895. Type: Greene, West Humboldt Mtns., Pershing County, Nevada. 18 July 1894. The specific name, *inconspicua*, and the common name both are descriptive of the plants.

DESCRIPTION: An erect stemmed annual up to 1.5 dm (6 in) high, freely branching from the base. The many elliptical leaves are 3.5 cm long or less, green above and somewhat paler below. They are entire and softly pubescent and possess a short winged petiole.

The inflorescence is shorter than the leaves or the flowers sometimes congested on branchlets on the upper parts. Individual flower stalks are 1 to 3 mm long and bear 3 mm tubular-bell shaped whitish flowers with linear, pubescent, 3 mm long calyx segments. The lobes on the corolla are erect and not spreading. The stamens are equal to or barely exceed the corolla in length, and have smooth stalks. The hairy style is 2.5 mm long.

The ovoid capsule is tapered to a short beak and is about 3 mm long, somewhat pubescent, and produces 4 seeds.

Phacelia humilis T.&G. is similar but has hairy stamen stalks, violet flowers, and linear-oblong to ovate leaves. *P. austromontana* J.T. Howell has glandular stems and leaves, open bell-shaped flowers, and leaves which are often pinnately lobed.

Flowering in June and July.

HABITAT: Rocky north or west facing slopes on loose soil rich in organic matter. Associated plants: *Juniperus osteosperma, Artemisia tridentata, Hydrophyllum occidentale, Microsteris gracilis, Galium bifolium,* and *Perideridia bolanderi.* Elevation: 1535-2415 m (5030-7920 ft).

KNOWN DISTRIBUTION: Pershing County, Nevada. Butte County, Idaho.

STATUS: Possibly extinct (Reno T/E Workshop, 25 Feb 1978); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; permit required for collection.

LAND OWNERSHIP/MANAGEMENT: BLM and possibly private.

EXISTING OR POTENTIAL THREATS: Mining activity.

REMARKS: The fact that there is considerable distance between the two known locations of *Phacelia inconspicua* suggests that this taxon may be more widely distributed. It is small and not easily detected in the field. Further surveys are necessary to determine the full range of this taxon and the threats to it.

CALOCHORTUS STRIATUS

CALOCHORTUS STRIATUS Parish
Streaked Mariposa Lily

FAMILY: Liliaceae -- Lily Family

CITATION AND HISTORY: *Calochortus striatus* Parish, Southern California Academy of Sciences, 1:122. 1902. Type: Parish, Rabbit Springs, Mojave Desert, CA, 2700 ft, May 1882. The petals of this mariposa lily are striped (or streaked) with dark purple lines giving rise to the common name and the specific name, *striatus*.

DESCRIPTION: A perennial arising from a small underground storage stem (corm), with two or three slender, erect branches reaching 3 dm (12 in) in height. There are several leaves about as long as the stem branches and 4 to 25 mm wide.

Two to eight flowers are borne in an umbel with the light purple petals uniformly striate with darker purple veins, and with the lower half sparsely white-hairy. The gland at the base of each petal is triangular and densely tufted with ascending whitish hairs.

The mature capsule is 4.5 to 5 cm (1.8 to 2 in) long and angled.

The conspicuously purple lined petals easily separate this species from any other likely to be found in Clark County. The nature of the gland separates this *Calochortus* from any other in southern Nevada.

Flowering from April to June.

HABITAT: In alkaline meadows or near a seep area. Associated plants: *Distichlis spicata* var. *stricta*, *Cleomella* sp., and *Anemopsis californica*. Elevation: 300-1370 m (985-4500 ft).

KNOWN DISTRIBUTION: Clark and Nye counties, Nevada. California.

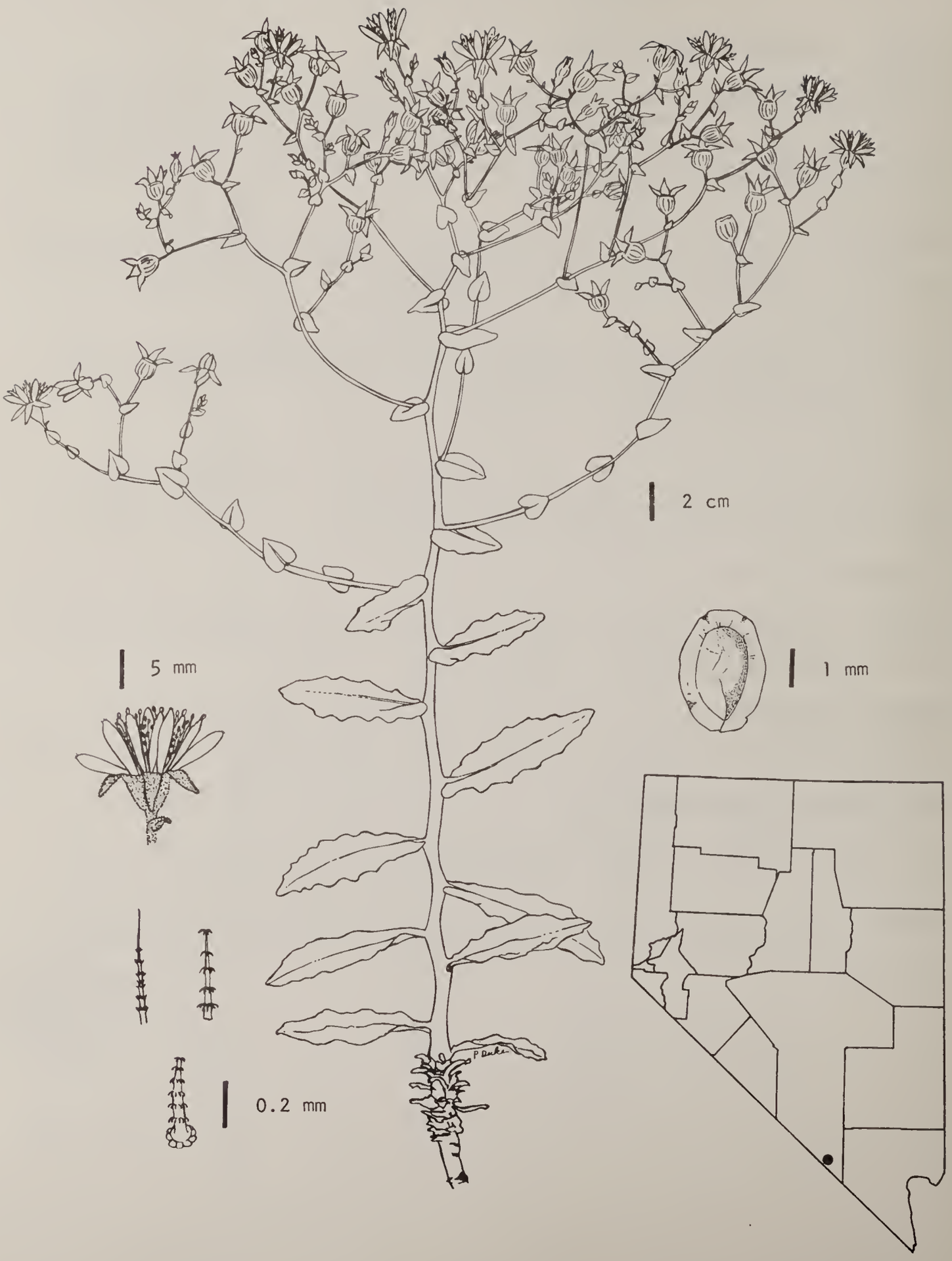
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, State of Nevada, and possibly private.

EXISTING OR POTENTIAL THREATS: Urban expansion. Drying up of spring areas. Proposed MX system (indirectly).

REMARKS: *Calochortus striatus* has been rarely collected in Nevada. Every effort should be made to relocate this rare species and preserve its habitat.

MENTZELIA LEUCOPHYLLA



MENTZELIA LEUCOPHYLLA Bdg.
Ash Meadows Blazing Star

FAMILY: Loasaceae -- Loasa Family

CITATION AND HISTORY: *Mentzelia leucophylla* Brandegee, Botanical Gazette 27: 448. 1899. Type: Purpus, Ash Meadows, Nye County, NV, May-October, 1898. The specific name, *leucophylla*, refers to the leaves which are covered with short white hairs.

DESCRIPTION: A biennial or short lived perennial plant with one to several white stems from a short tap root and attaining a height of 5 dm (20 in). The whitish-green basal leaves (not shown in the illustration) are linear-oblong and with a wavy margin and 6 to 8 cm (2.4 to 3.2 in) long. The similar stem leaves are proportionately wider and about 4 cm (1.6 in) long. The leaves are densely clothed on both surfaces with short, rigid, upwardly barbed hairs and with minute barbed bristles along the margin. The upper stem leaves have a cordate-clasping base.

The flowers are bright yellow on 1 to 8 mm stalks in an open, broad inflorescence. The narrow triangular sepals are 6 mm long and are exceeded by the 1 cm spatulate petals which are slightly pubescent at the tip.

The nearly spherical capsule is 8 to 10 mm long and produces flat, narrowly margined seeds.

Mentzelia oreophila Darl. resembles this species, but is smaller (to 15 cm), has more slender and somewhat crooked stems and the leaves are narrower with the lower ones possessing long petioles.

Flowering from June to September.

HABITAT: Along canyon washes and near spring areas, on sandy or saline clay soils. Associated plants: *Atriplex confertifolia, Haplopappus acradenius, Cryptantha confertiflora, Enceliopsis nudicaulis* var. *corrugata,* and *Astragalus phoenix.* Elevation: 670-1980 m (2200-6500 ft).

KNOWN DISTRIBUTION: Nye County, Nevada. This taxon was listed in the *Federal Register* from California, but apparently this was an error.

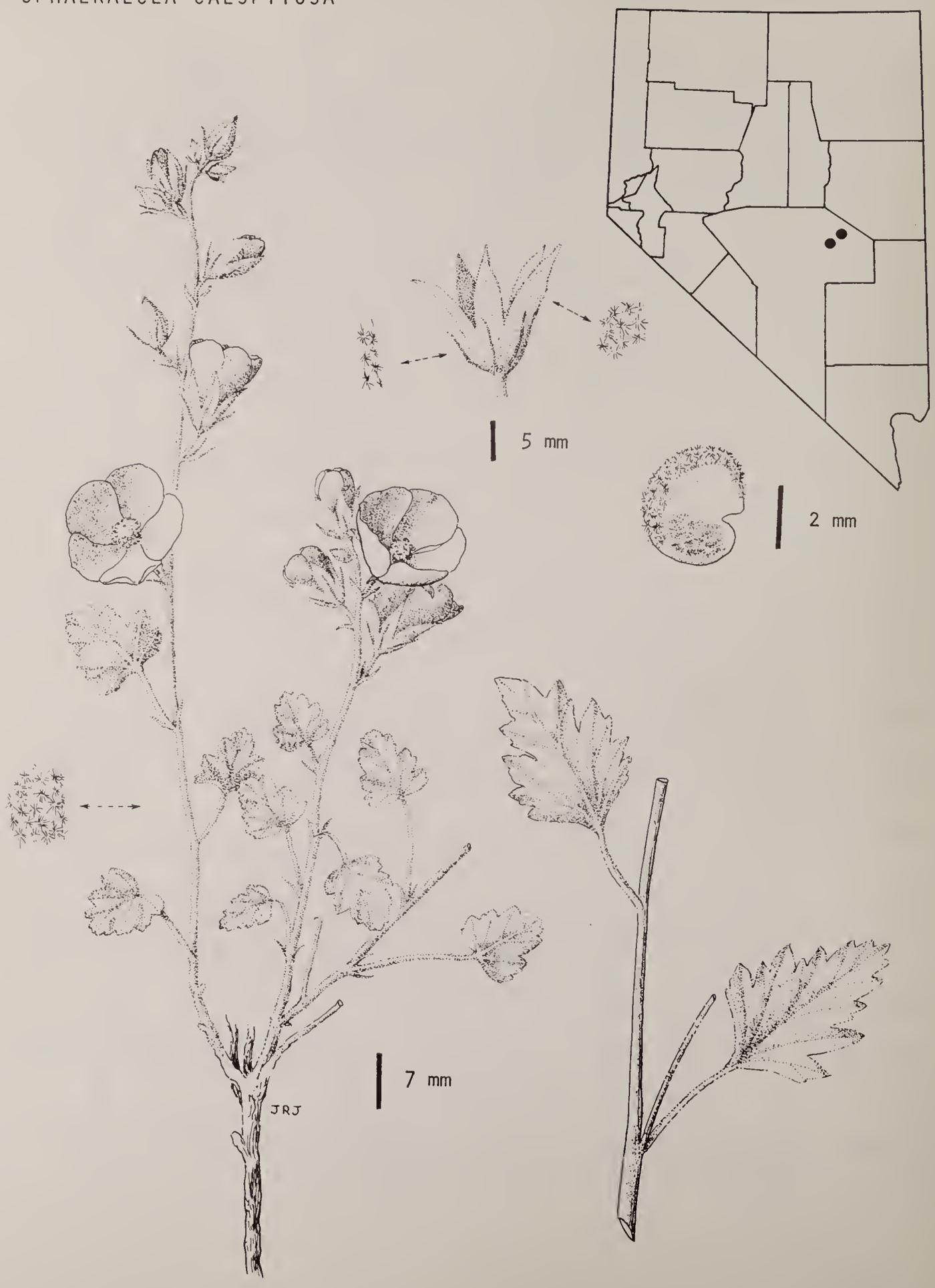
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 November 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Utilization of land for agricultural or other developmental purposes. Destruction by free roaming horses. Proposed MX system (indirectly).

REMARKS: *Mentzelia leucophylla* appears to be limited to a particular edaphic condition so that any loss of habitat is critical.

SPHAERALCEA CAESPITOSA



SPHAERALCEA CAESPITOSA M.E. Jones
Tufted Globe-mallow

FAMILY: Malvaceae -- Mallow Family

CITATION AND HISTORY: *Sphaeralcea caespitosa* M.E. Jones, Contributions to Western Botany, 12:4. 1908. Type: Jones, Beaver Co,, Utah, 6000 ft, 25 June 1906. The specific name, *caespitosa*, means tufted.

DESCRIPTION: A perennial with a thick, woody crown and relatively short stems to 20 cm (8 in) long which are prostrate or ascending in habit. The wide, thick, ovate leaves are prominently veined beneath, coarsely and irregularly toothed and 2 to 4 cm (0.8 to 1.6 in) long. The leaves and stems are densely soft-pubescent.

The inflorescence is few flowered (less than 10), with rather slender individual flower stalks. The calyx is about 15 mm long and the lobes are about 3 times as long as the fused portion at the base. The petals are reddish-orange in color and 22 mm long.

The fruits are approximately hemispherical and about half as long as the calyx. At maturity they are divided into about 13 segments, with the upper portion of each becoming dehiscent, and the lower third remaining indehiscent. Each segment contains one or two sparsely pubescent seeds.

From *S. munroana* (Dougl.) Spach and *S. grossulariifolia* (H.&A.) Rydb., this species can be distinguished by its dwarf stature, longer hairs, few flowers in the inflorescence and a more deeply divided calyx. From the common *S. parvifolia* A. Nelson it can be separated by the same set of characters. The Nevada plants tend to be somewhat taller than the Utah plants and differ in other respects as well. The drawing was prepared from a Nevada plant.

Flowering in May and June.

HABITAT: Gravelly limestone soil, sometimes on sandy soil. Associated plants: *Eriogonum shockleyi, Atriplex confertifolia, Kochia americana, Artemisia spinescens, Ephedra viridis, Hilaria jamesii,* and *Lycium* sp. Elevation: 1525-1980 m (5000-6500 ft).

KNOWN DISTRIBUTION: Nye County, Nevada. Beaver and Millard counties, Utah.

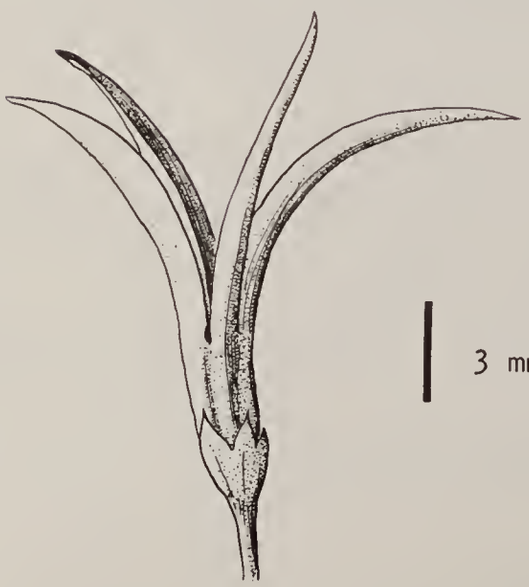
STATUS: Threatened (Reno T/E Workshop, 2 November 1979).

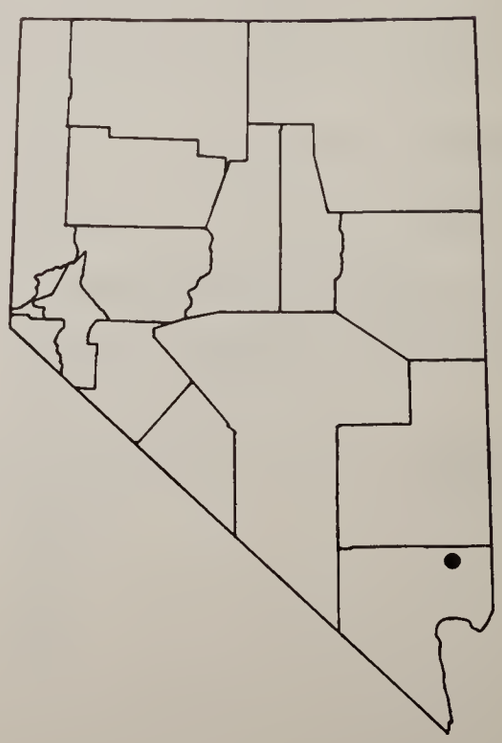
LAND OWNERSHIP/MANAGEMENT: BLM and possibly private.

EXISTING OR POTENTIAL THREATS: Mining activity. Drilling for oil. Proposed MX system.

REMARKS: This species is extremely localized in Nevada.

FRAXINUS CUSPIDATA var. MACROPETALA





FRAXINUS CUSPIDATA Torr. var. MACROPETALA (Eastw.) Rehder
Fragrant Ash

FAMILY: Oleaceae -- Ash Family

CITATION AND HISTORY: *Fraxinus cuspidata* var. *macropetala* (Eastw.) Rehder, Proceedings of the American Academy of Arts and Sciences, 53:201. 1917. Synonym: *F. macropetala* Eastwood, Bulletin of the Torrey Botanical Club, 20:494. 1903. Type: Wooton, Grand Canyon, Coconino Co., Arizona, 9 July 1902. This ash has flowers which have long petals hence the varietal name, *macropetala*.

DESCRIPTION: A 3 to 5 m (10 to 17 ft) tall shrub branching from the base, with slender, upright stems. The leaves are compound with 3 to 5 broad, obovate or ovate leaflets which taper at both the base and the tip. They are 1.5 to 3 cm (0.6 to 1.2 in) long with margins which have pointed or rounded teeth.

The inflorescence bears numerous flowers which are green to white with a corolla about 12 mm long. The petals are united into a tube at the base with the sepals equalling or a little longer than this tube. There are two stamens attached to the inside of the corolla tube.

The winged fruit ultimately reaches a length of 2 to 2.5 cm (0.8 to 1 in).

All the other *Fraxinus* species in the same general area have flowers which lack petals. *Fraxinus anomala* Torr. usually has just one leaflet, rarely three, while *F. velutina* var. *coriacea* (S. Wats.) Rehd. has three to seven larger leaflets, 2 to 8 cm (0.8 to 3.2 in) long which are thicker and vary in shape from lanceolate to obovate.

Flowering in May.

HABITAT: About small springs or swamps. Associated plants: unknown. Elevation: 610-2200 m (2000-7215 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. Arizona.

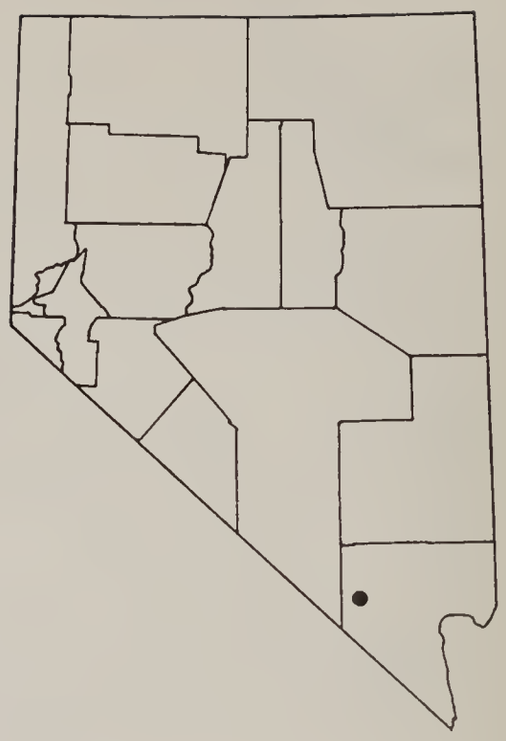
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: BLM and/or possibly private.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: There are no known collection records for this taxon in Nevada since 1934. A concerted effort should be made to relocate this taxon in Nevada and determine the threats to it. Apparently it is widely distributed in Arizona.

EPILOBIUM NEVADENSE



2 mm

1 cm

2 mm

EPILOBIUM NEVADENSE Munz
Nevada Willowherb

FAMILY: Onagraceae -- Evening Primrose Family

CITATION AND HISTORY: *Epilobium nevadense* Munz, Bulletin of the Torrey Botanical Club, 56:166. 1929. Type: Jaeger, Charleston (Spring) Mountains, Clark County, Nevada, 9200 ft, 4 Sept 1927. The specific name, *nevadense*, is taken from the Spanish word meaning snow-covered.

DESCRIPTION: A low, sub-shrubby, clumped perennial with a woody root-stock producing dark brown prostrate branches with freely exfoliating bark. These prostrate branches in turn give rise to numerous erect, slender, straw-colored, often purple tinged, pubescent, simple stems 12 to 25 cm (4.8 to 10 in) high. The leaves are nearly hairless, somewhat glaucous, with small teeth, either green or purplish, and tipped with an inconspicuous, stout, rigid, gland. The lower leaf blades are opposite, obtuse, and 8 to 15 mm long by 2 to 3 mm wide. The main stem leaves are alternate, somewhat narrower, and gradually reduced towards the top of the stem.

The flowers are in loose racemes, and either sessile or on short glandular stalks. The calyx is glandular, 5 to 8 mm long, tinged reddish, and the calyx teeth are turned backwards when the flowers open. The petals are rosy-violet-purple, 6 to 7 mm long, broad, and notched at the tip. The smooth style is about 10 mm long with a squarish 1 mm broad stigma bearing four somewhat triangular reflexed lobes.

The capsules are glandular pubescent, 8 to 12 mm long by 1.5 to 2 mm wide. The smooth brown seeds have a tuft of white hairs about 5 mm long.

While this species is similar to *Epilobium nivium* Bdg., the latter species differs in its entire, pubescent, narrower leaves, and less glandular flowers. The seeds of *E. nivium* have a tuft of "dingy" white hairs.

Flowering from July to September.

HABITAT: Limestone talus slopes with rock outcrops or with considerable soil. Associated plants: *Pinus monophylla*, *P. ponderosa* var. *scopulorum*, and *Castilleja clokeyi*. Elevation: 2270-2800 m (7450-9200 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. Washington County, Utah.

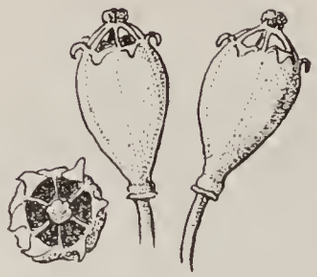
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: USFS.

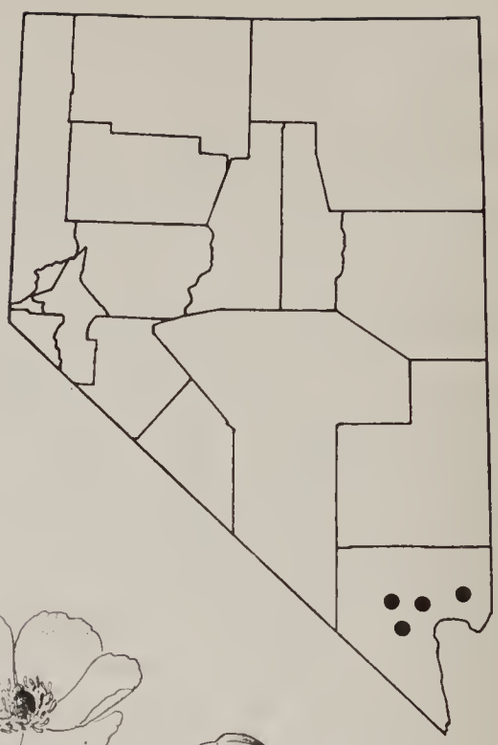
EXISTING OR POTENTIAL THREATS: Increased recreational use of the area. Unstable talus slopes. The seeds sometimes are eaten by moth larvae. Proposed MX system (indirectly).

REMARKS: *Epilobium nevadense* is very narrowly restricted in both Nevada and and Utah. Increasing population in southern Nevada will increase the impact on the plants there.

ARCTOMECON CALIFORNICA



1 cm



1 cm

ARCTOMECON CALIFORNICA Torr. & Frém.
Golden Bear Poppy

FAMILY: Papaveraceae -- Poppy Family

CITATION AND HISTORY: *Arctomecon californica* Torr. & Frém., *In:* Report of the exploring expedition to the Rocky Mountains, 312 (174). 1845. Type: Frémont, "...found in only a single station in the California Mountains, on the banks of a creek." At that time the state of Nevada did not exist, and the area in which the plants are now found was then part of California. The generic name is from the Greek, *arctos*, a bear, and *mecon*, a poppy.

DESCRIPTION: A low, broad, caespitose perennial branching from a thick woody root and attaining a height of 10 cm (4 in) not including the flowering stems. The wedge-shaped oblanceolate leaves are 2 to 3 cm (0.8 to 1.2 in) long, glaucous and covered with 1 cm long white, spreading hairs. The upper leaves may be sessile and may lack the three-toothed blunt apex.

The several naked flower stalks, 20 to 40 cm (8 to 16 in) long bear several yellow flowers 5 to 8 cm (2 to 3 in) across. The 2 or 3 hairless sepals are 1.3 to 2 cm (0.5 to 0.8 in) long and drop off soon after the flower opens. There are usually six yellow obcordate petals 2.5 to 4 cm (1 to 1.6 in) long. The many stamens and styles are united together.

The seed capsule attains a length of about 1.5 cm (0.6 in).

Arctomecon merriamii can also be found in this same area but it has white flowers borne singly on each stem.

Flowering in April and May.

HABITAT: Barren, gravelly desert flats, hummocks, and slopes; often found in soil heavily impregnated with gypsum. Associated plants: *Larrea tridentata, Ambrosia dumosa, Enceliopsis argophylla* var. *grandiflora, Lepidium fremontii,* or *Psorothamnus fremontii*. Elevation: 400-840 m (1310-2760 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. Arizona near Lake Mead.

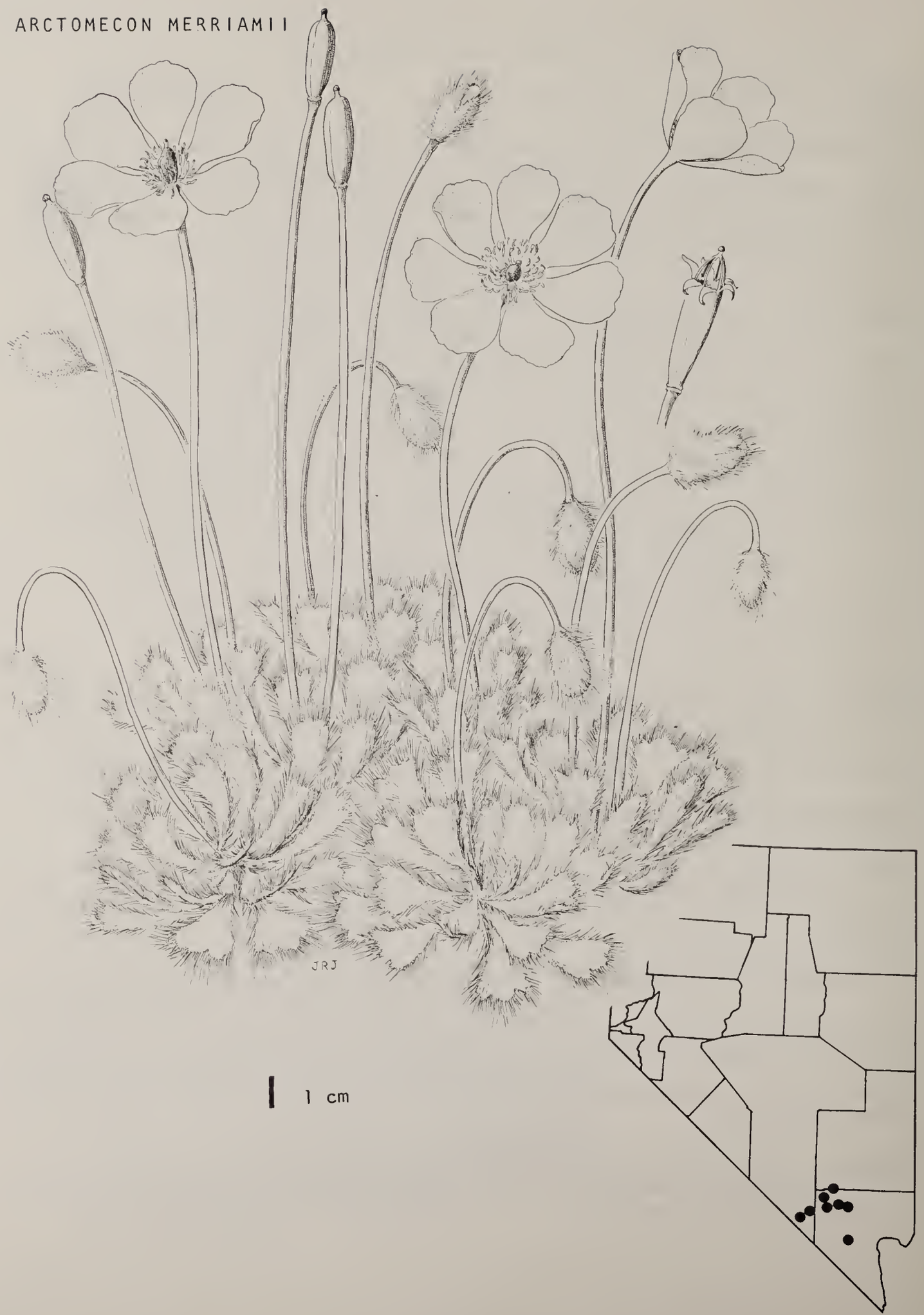
STATUS: Endangered (Reno T/E Workshop, 9 Feb 1979); threatened (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP/MANAGEMENT: BLM, DOD (Nellis AFB Bombing and Gunnery Range), National Park Service, State of Nevada, and private.

EXISTING OR POTENTIAL THREATS: Urbanization. Off-road vehicles. Grazing and habitat destruction by feral horses and burros. Surface mining. Collection of plants for horticultural purposes. Proposed MX system (indirectly).

REMARKS: Plants cannot be transplanted and apparently no one has been able to grow plants successfully from seed to maturity. Known populations of this taxon should be monitored.

ARCTOMECON MERRIAMII



ARCTOMECON MERRIAMII Cov.
Merriam Bear Poppy

FAMILY: Papaveraceae -- Poppy Family

CITATION AND HISTORY: *Arctomecon merriamii* Coville, Proceedings of the Biological Society of Washington, 7:66. 1892. Type: Merriam and Bailey, a few miles west of the Vegas Ranch, Lincoln County (now Clark Co.), Nevada, 750 m, 1 May 1891. This poppy is dedicated to C.H. Merriam, one of the collectors of the type specimen.

DESCRIPTION: A perennial producing a clump of cuneate-oblanceolate leaves from short stems atop a stout taproot. The leaves are clothed with very long, spreading hairs. There are several flowering stems which may reach a height of 3.5 dm (14 in).

Each flowering stem bears a single flower with 3 sepals and 6 white petals. There are numerous stamens and a narrow oblong ovary. The capsule may eventually attain a length of about 3.5 cm (1.4 in).

This is a very unique plant easily separated from *Arctomecon californica* Torr. & Frém. which has yellow flowers borne 6 to 20 on the flower stalks and ovate capsules only about 1.5 cm long.

Flowering from April to early June.

HABITAT: Shallow gravelly soil, limestone outcrops, or flats or old lake beds. Associated plants: *Larrea tridentata*, *Atriplex confertifolia*, *Coleogyne ramosissima*, and *Ambrosia dumosa*. Elevation: 670-1465 m (2200-4800 ft).

KNOWN DISTRIBUTION: Clark, Lincoln, and Nye counties, Nevada. California.

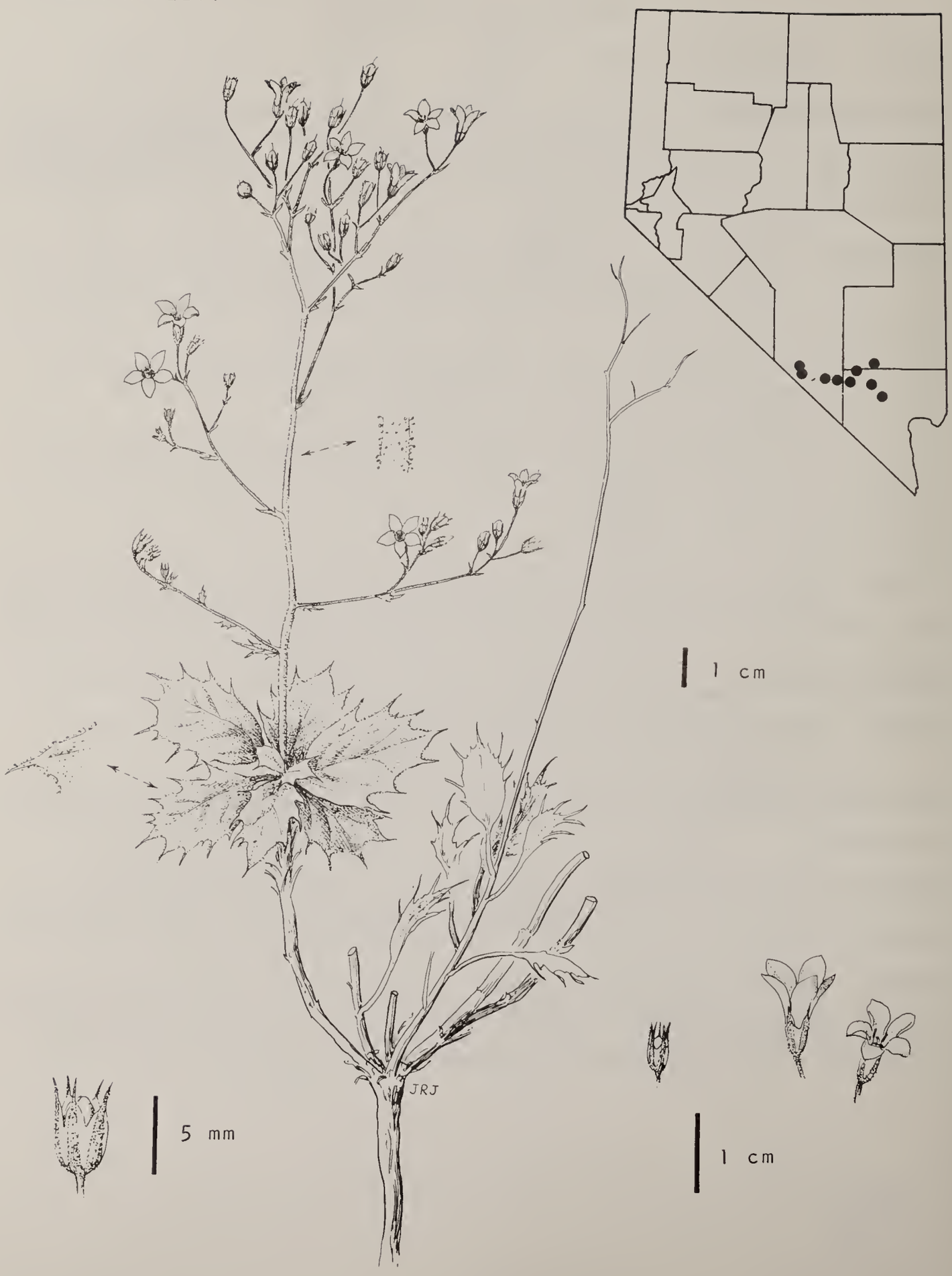
STATUS: Threatened (1979 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, DOE (Nevada Test Site), DOD (Nellis AFB Bombing and Gunnery Range), State of Nevada, USFWS, and private.

EXISTING OR POTENTIAL THREATS: Urban expansion. Land development. Off-road vehicles. Removal of plants for horticultural purposes. Proposed MX system.

REMARKS: It is possible that *Arctomecon merriamii* has been extirpated near Las Vegas by development of that metropolitan area. However, it is a widely distributed species. There will be no threats to it in the Desert National Wildlife Range if present management policies continue.

GILIA RIPLEYI



GILIA RIPLEYI Barneby
Ripley Gilia

FAMILY: Polemoniaceae -- Phlox Family

CITATION AND HISTORY: *Gilia ripleyi* Barneby, Leaflets of Western Botany, 3: 129. 1942. Synonym: *Gilia gilmanii* Jepson, Flora of California, 3:192. 1943. Type: Ripley and Barneby, south end of Specter Range, Nye County, Nevada, 3100 ft, 18 July 1941. The specific name, *ripleyi*, and the common name both honor Dwight Ripley, one of the collectors of the type.

DESCRIPTION: A many-stemmed perennial somewhat woody at the base and bearing characteristic holly-shaped leaves 3 to 4 cm (1.2 to 1.6 in) long by 2 to 3 cm (0.8 to 1.2 in) wide, toothed with rigid triangular teeth about 4 mm long.

The inflorescence is open and densely glandular as are the leaves. Flower pedicels are threadlike and bear bright rose colored to sometimes pale pink flowers. The calyx varies from 2 to 6 mm in length while the corolla varies from 7 mm to 2 cm in length.

This is an easily recognized *Gilia* which could be confused only with *Gilia latifolia* S. Wats., which, however, is an annual plant confined to gravelly desert washes unlike *G. ripleyi* which usually is confined to the exposed crevices of limestone cliffs.

Flowering from May to October; the peak of flowering is in June and July.

HABITAT: Exposed crevices of steep south-facing limestone cliffs, occasionally in loose talus or gravelly slopes below cliffs. Associated plants: *Haplopappus brickellioides*, *Perityle megalocephala* var. *intricata*, *Penstemon petiolatus*, *Gilia scopulorum*, *Buddleja utahensis*, and occasionally with *Agave utahensis* var. *eborispina*, *Larrea tridentata*, or *Atriplex confertifolia*. Elevation: 915-1525 m (3000-5000 ft).

KNOWN DISTRIBUTION: Clark, Lincoln, and Nye counties, Nevada. Inyo County, California.

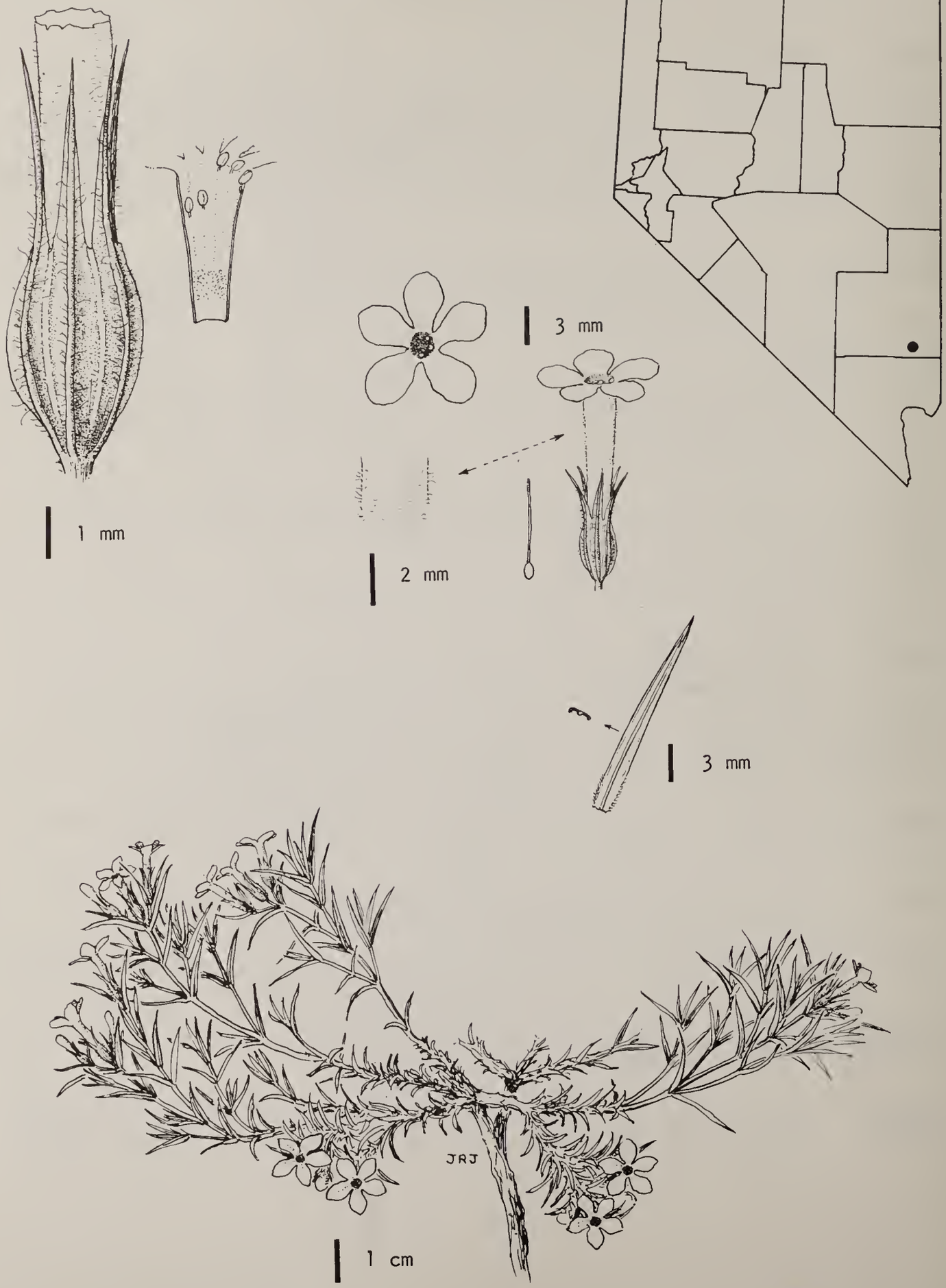
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, DOE (Nevada Test Site), DOD (Nellis AFB Bombing and Gunnery Range); USFWS and private.

EXISTING OR POTENTIAL THREATS: Erosion or landslides. Mining activity. Proposed MX system.

REMARKS: The rarity of this species and its specialized habitat requirements indicate that the known populations should be monitored.

PHLOX GLADIFORMIS



PHLOX GLADIFORMIS (Jones) E. Nels.
Musky Phlox

FAMILY: Polemoniaceae -- Phlox Family

CITATION AND HISTORY: *Phlox gladiformis* (Jones) E. Nelson, Revision of the Western North American Phloxes, p. 21. 1899. Synonym: *Phlox longifolia* var. *gladiformis* Jones, Proceedings of the California Academy of Sciences, Ser. 2, 5:711. 1895. Type: M.E. Jones, Cedar Creek Canyon, Utah, 11 June 1894. The specific name, *gladiformis*, is descriptive of the dagger shaped leaf. The musky odor gives this plant its common name.

DESCRIPTION: A perennial which forms a cushion 6 to 15 cm (2.4 to 6 in) high with the stems and leaves glandular-hairy and characteristically producing, when fresh, a strong musky odor. The firm and sharp-pointed leaves are linear lanceolate and may reach a length of 25 mm.

The inflorescence commonly produces 1 to 3 pale lilac to lavender or whitish flowers which are glandular-pubescent. The sepals are united for 3/8 to 5/8 of their length and may become 9.5 mm long. The tubular portion of the corolla is 8 to 15 mm long, with the petal blade averaging 7 mm long. The style varies from 2.5 to 5.5 mm long.

This species somewhat resembles the similar *P. douglasii* Hook., but the latter has smaller leaves, generally shorter corolla tubes, and slightly shorter petal blades. The calyx is glandular and long-hairy unlike the simply glandular pubescent calyx of *P. gladiformis*. However, the most striking field characteristic of this rare phlox is its unusual musky odor.

Flowering from May to July.

HABITAT: Gravelly, heavy clay soil; rocky slopes. Associated plants: yellow pine forest community. Elevation: 915-2440 m (3000-8000 ft).

KNOWN DISTRIBUTION: Lincoln County, Nevada. Utah.

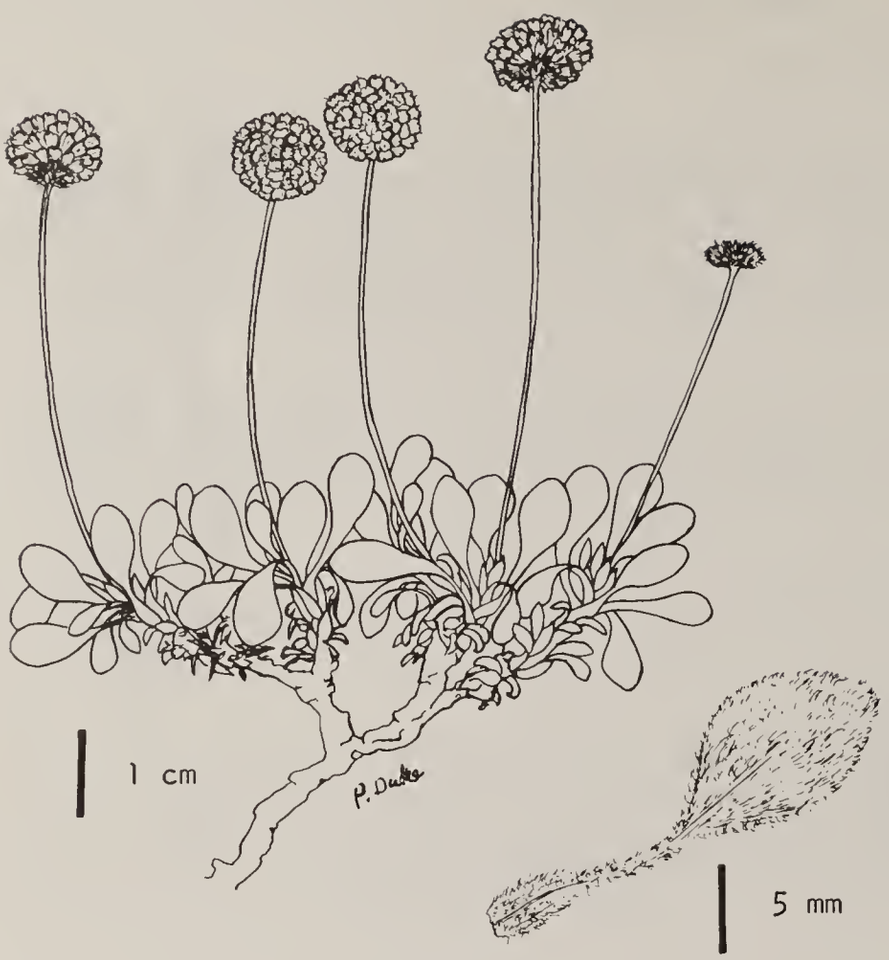
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

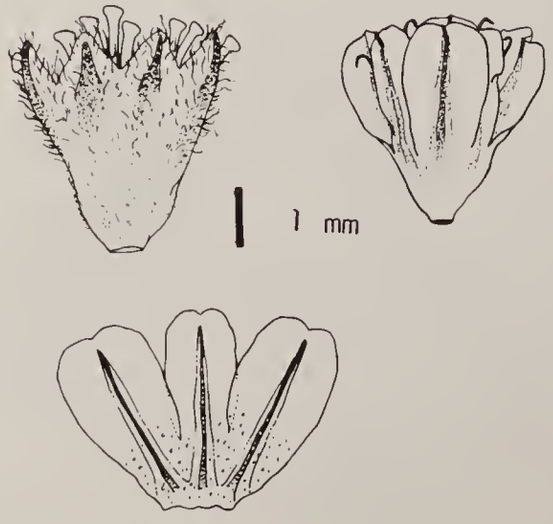
LAND OWNERSHIP/MANAGEMENT: BLM.

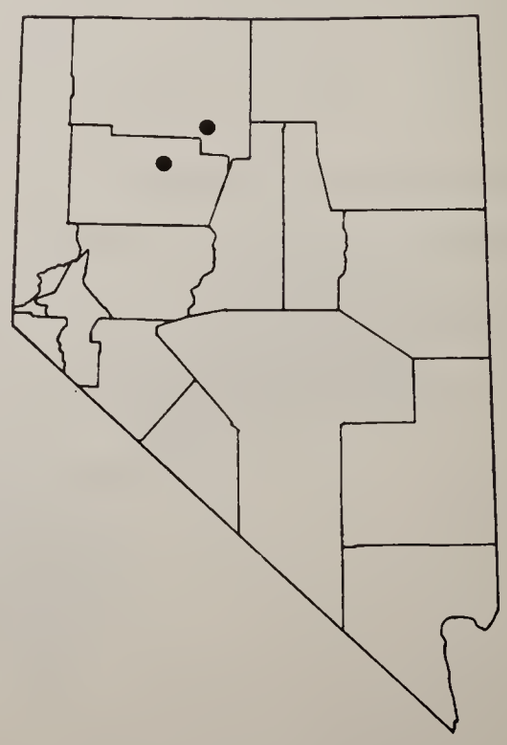
EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: Not enough is known about this rare taxon in Nevada to determine if there are any other threats to it. An intensive search should be conducted to determine its distribution and abundance.

ERIOGONUM ANEMOPHILUM







ERIOGONUM ANEMOPHILUM Greene
Wind Loving Buckwheat

FAMILY: Polygonaceae -- Buckwheat Family

CITATION AND HISTORY: *Eriogonum anemophilum* Greene, Pittonia, 3:199. 1897. Synonym: *Eriogonum ochrocephalum* S. Wats. ssp. *anemophilum* (Greene) S. Stokes, The Genus *Eriogonum*, p. 92. 1936. Type: Greene, northern end of West Humboldt Range, Nevada, July 1894. The common name and the specific name, *anemophilum*, refer to the bleak windy summits where these plants grow.

DESCRIPTION: A low, clumped perennial with a woody root-stock, very leafy with the leaves densely white pubescent. The leaf blades are obovate to subcircular, up to 1.3 cm (0.5 in) long and possess petioles of a similar length.

The leafless flower stalks are up to 7.6 cm (3 in) tall and bear a terminal cluster of flowers embedded in a loose, white, woolly pubescence. The perianths are cream colored fading to reddish and not narrowed at the base; the individual segments are broad and obtuse or notched at the tip. The staminal filaments and ovary are hairless.

The typical form of *Eriogonum ochrocephalum* differs in having oblanceolate leaves 2 to 5 cm (0.8 to 2 in) long and yellow flowers. Plants of the Sierra Nevada were incorrectly referred to *Eriogonum anemophilum*.

Flowering in late June and July.

HABITAT: Exposed ridges and slopes in loose gravel of limestone or on volcanic outcrops. Associated plants: *Haplopappus acaulis, Pteryxia terebinthina, Astragalus calycosus* var. *calycosus, Lygodesmia spinosa, Eriogonum umbellatum* var., *Chrysothamnus viscidiflorus, Artemisia arbuscula,* and *Poa sandbergii*. Elevation: 2195-2575 m (7200-8450 ft).

KNOWN DISTRIBUTION: Pershing and Humboldt counties, Nevada.

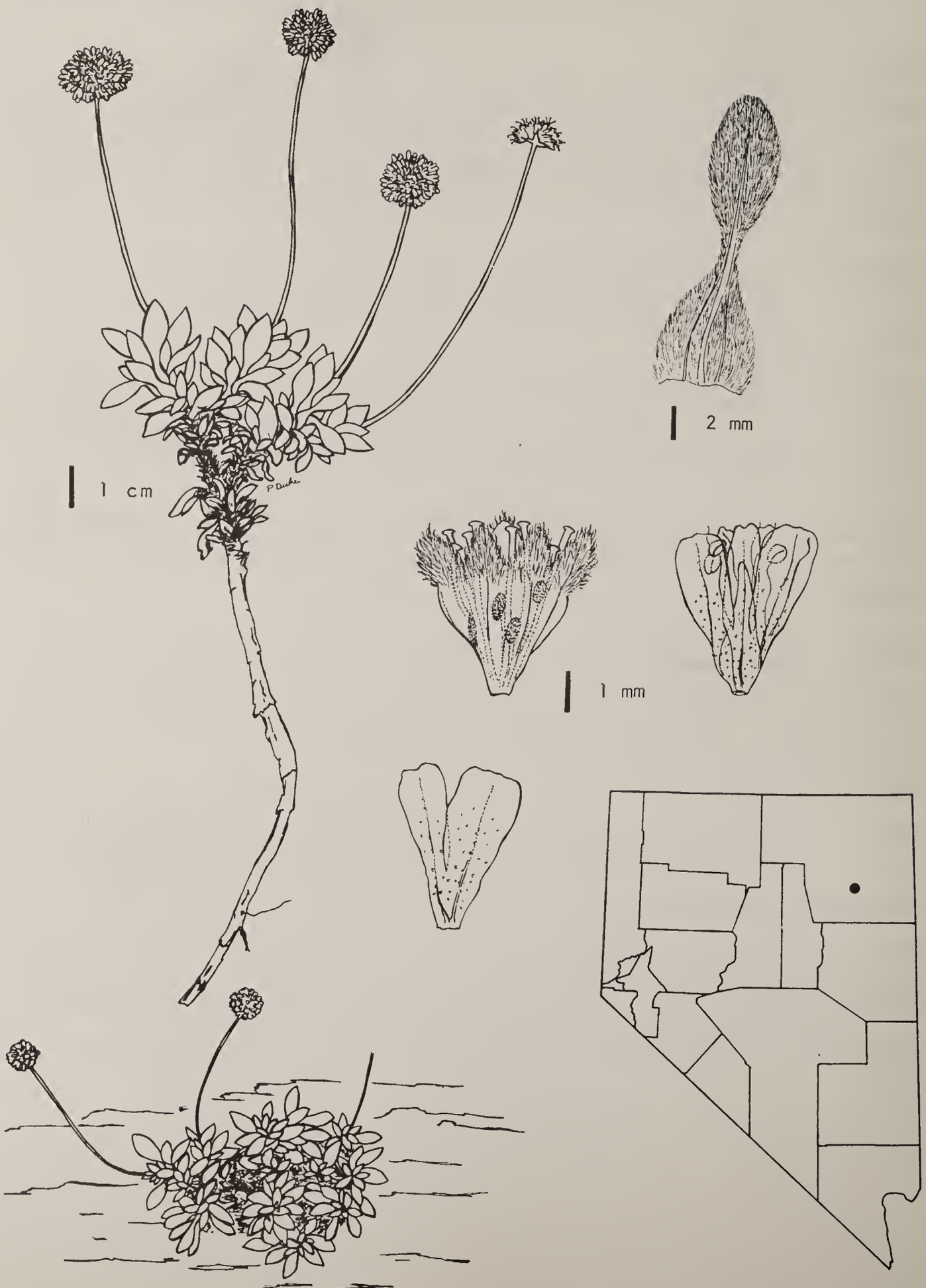
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Trampling by wild horses. Mining activity.

REMARKS: Considering the wide distribution of the populations of *Eriogonum anemophilum*, at the present time the taxon as a whole is not threatened. The remote locations where it is found offer additional protection.

ERIOGONUM ARGOPHYLLUM



ERIOGONUM ARGOPHYLLUM Reveal
Silver Leaf Buckwheat

FAMILY: Polygonaceae -- Buckwheat Family

CITATION AND HISTORY: *Eriogonum argophyllum* Reveal, Phytologia, 23:168. 1972. Type: Holmgren and Kern, Sulphur Hot Springs, Elko County, Nevada, 6050 ft, 7 July 1969. The common name is derived from the specific name, *argophyllum*.

DESCRIPTION: A low, clumped herbaceous perennial typically forming a mat 1 to 2 dm (4 to 8 in) across. The oblanceolate to elliptic leaf blades are 4 to 8 mm long with a short petiole 0.5 to 1 mm long. The petiole base is expanded into a section 1 to 2.5 mm broad. The leaves are densely white pubescent on both surfaces.

The flowering stems are leafless, with the individual flowers congested into a head 5 to 10 mm across. The lanceolate bracts at the base of the flower head are 5 to 6 scale-like structures 2 to 2.5 mm long, and fused basally. The individual flowers are yellow, becoming tinged with reddish-brown at maturity in some. They are glandular within, especially along the midribs, and sparsely glandular along the midribs without. The outer whorl of perianth segments is composed of broader segments than the inner whorl. The relatively long, exserted stamens (3 to 3.5 mm long) are sparsely pubescent at the base of the filaments.

This species is somewhat similar to *Eriogonum kingii* T.&G., but the latter species has larger leaves (blades 5 to 10 mm long, the petioles 4 to 12 mm long), fewer involucres per head (3 to 5, compared to 5 to 7 for *E. argophyllum*), and bigger involucres (3 to 3.5 mm long, contrasted with 2 to 2.5 mm for *E. argophyllum*).

Flowering in June and July.

HABITAT: Sandy washes on crusty mineralized sand below a saline hot spring on a ranch. Associated plants: *Senecio* sp. Shadscale surrounds the ranch. Elevation: 1845 m (6050 ft).

KNOWN DISTRIBUTION: Elko County, Nevada.

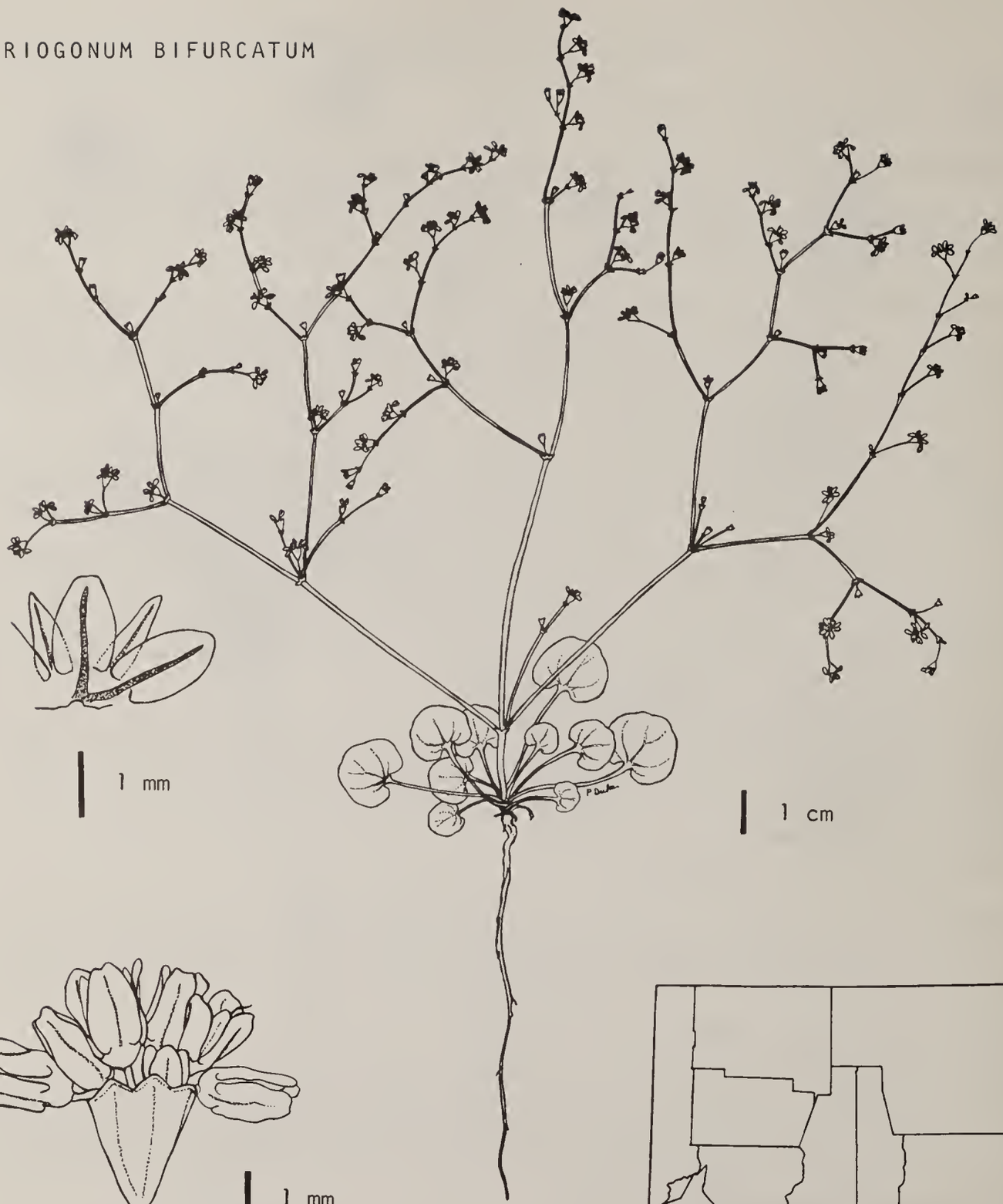
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP MANAGEMENT: Private.

EXISTING OR POTENTIAL THREATS: Grazing. Any change in land use or change in water flow from the spring.

REMARKS: *Eriogonum argophyllum* is only known from one location. Apparently it is restricted to a particular edaphic condition. Many nearby spots which appear to be similar have been searched without success.

ERIOGONUM BIFURCATUM



ERIOGONUM BIFURCATUM Reveal
Pahrump Valley Buckwheat

FAMILY: Polygonaceae -- Buckwheat Family

CITATION AND HISTORY: *Eriogonum bifurcatum* Reveal, Aliso, 7:357. 1971. Type: Reveal, Pahrump Valley, Nye County, NV, 13 June 1970. The specific name, *bifurcatum*, refers to the way the plants branch.

DESCRIPTION: A low, spreading annual 1.5 to 4 dm (6 to 16 in) high, and 3 to 15 dm (12 to 60 in) across, counting the width of the inflorescence. The plants are nearly hairless, with the basal leaves round-cordate and with blades 1 to 3 cm (0.4 to 1.2 in) long and wide. They are densely white pubescent below.

The main flowering stem is short, green, and glaucous. The bracts at the nodes of the inflorescence branches are scale-like and 1 to 2 mm long. The individual involucres are erect, sessile, 2 to 2.5 mm long, and hairless. Each involucre bears 10 to 20 white flowers with greenish to reddish midribs and bases; each flower is 1.5 to 2 mm long. The outer perianth segments are much broader than the inner and slightly longer. The exserted stamens have filaments which are sparsely pubescent basally and have red to reddish-purple anthers.

This species most closely resembles *Eriogonum insigne* S. Wats., however, at maturity, the latter is a larger plant, often more than 1 meter tall, with a narrow inflorescence.

Flowering in May and June.

HABITAT: Rolling hills, saline flats. Associated plants: *Atriplex confertifolia* and *A. canescens*. Elevation: 760-775 m (2500-2550 ft).

KNOWN DISTRIBUTION: Nye County, Nevada. Inyo County, California.

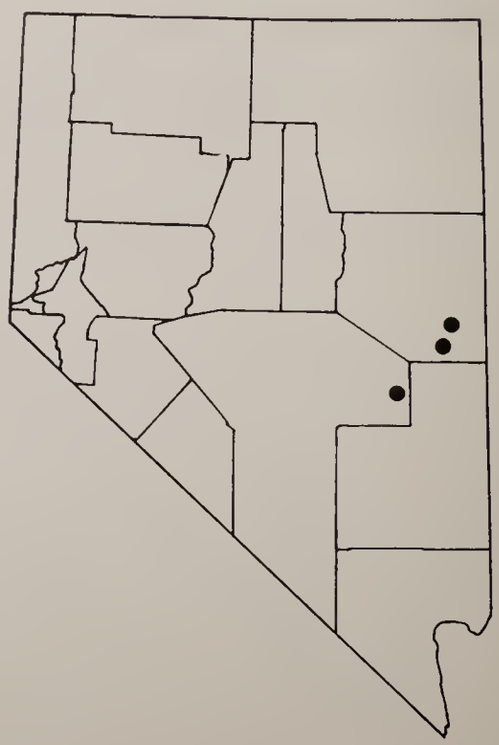
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Destruction of habitat by farming and housing developments. Proposed MX system.

REMARKS: The known populations of *Eriogonum bifurcatum* should be monitored.

ERIOGONUM DARROVII



ERIOGONUM DARROVII Kearney
Darrow Buckwheat

FAMILY: Polygonaceae -- Buckwheat Family

CITATION AND HISTORY: *Eriogonum darrovii* Kearney, Leaflets of Western Botany, 4:267. 1946. Type: Darrow, Coconino County, Arizona, 31 August 1945. The species was named for the collector of the type specimen, Robert A. Darrow.

DESCRIPTION: An annual, compact, many branched plant with short internodes and numerous leaves. Individual branches may be up to 10 cm (4 in) long. The elliptical or spatulate leaf blades are about 10 mm long by 8 mm wide, with only a small diminution in size upwards. Leaves, stems, bracts, and involucres are minutely and softly pubescent.

The subsessile involucres are solitary in the leaf axils and bear up to 18 flowers each. The flowers are yellow in bud, but turn pink about the time they open. The individual flowers are about 1.5 mm long.

This is a very distinctive species, and while the flowers resemble those of other species, the general form and leafy nature of the plant separate it unmistakably from other buckwheats.

Flowering in late July and August.

HABITAT: Very hard, dry, fine soil with chunks of limestone; in washes and and on flats. Associated plants: *Juniperus osteosperma, Chrysothamnus viscidiflorus, Artemisia tridentata, Petrophytum caespitosum,* and *Cowania mexicana* var. *stansburiana.* Elevation: 1860-1980 m (6100-6500 ft).

KNOWN DISTRIBUTION: Nye and White Pine counties, Nevada. Arizona.

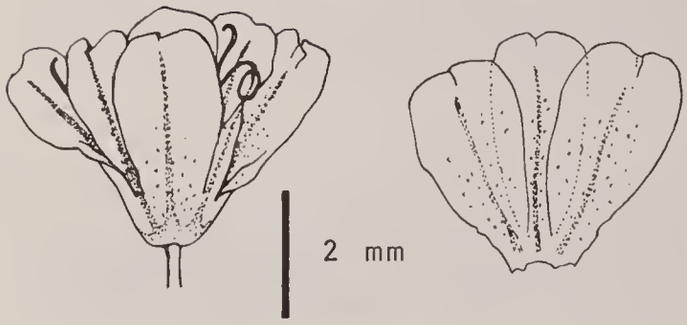
STATUS: Endangered (1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979); deleted (Mozingo and Williams).

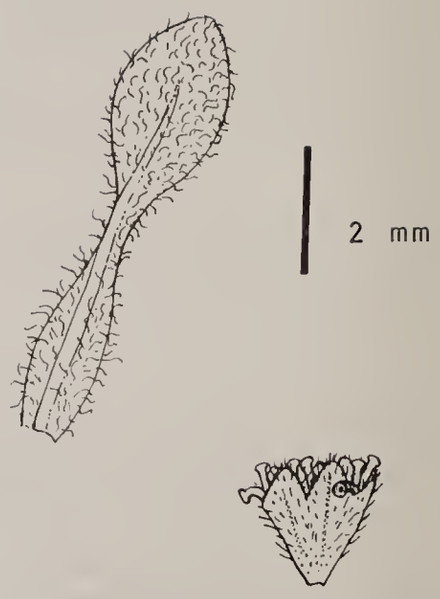
LAND OWNERSHIP/MANAGEMENT: BLM and Nevada State Department of Wildlife.

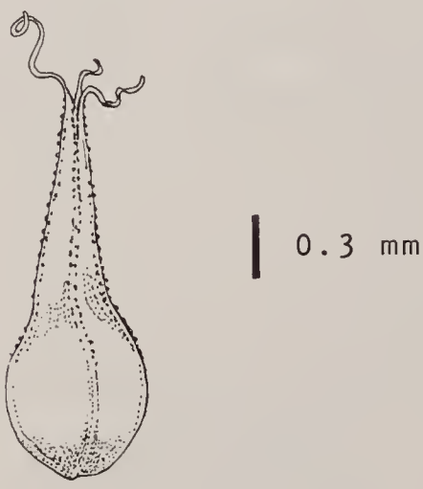
EXISTING OR POTENTIAL THREATS: Proposed MX system.

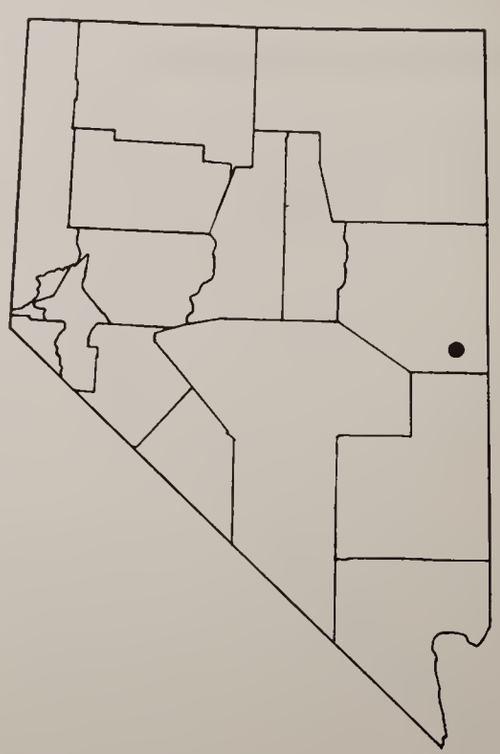
REMARKS: Recent collections have extended the range of *Eriogonum darrovii* considerably.

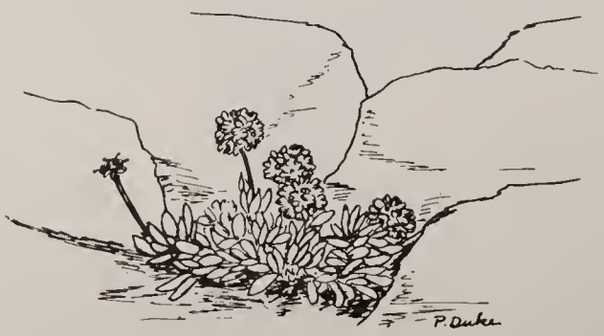
ERIOGONUM HOLMGRENII











ERIOGONUM HOLMGRENII Reveal
Holmgren Buckwheat

FAMILY: Polygonaceae -- Buckwheat Family

CITATION AND HISTORY: *Eriogonum holmgrenii* Reveal, Leaflets of Western Botany, 10:184. 1965. Type: Holmgren and Reveal, Snake Range, White Pine County, Nevada, 11,280 ft, 10 August 1964. This species is named in honor of Noel H. Holmgren, one of the collectors of the type specimen.

DESCRIPTION: A dense, mat-forming perennial branching from a woody base. The oblanceolate or spatulate leaves are densely whitish-green tomentose below, less so above, and 3 to 10 mm long by 2 to 4 mm wide. Intermingled with the long hairs are small stalked glands. The petiole is 2 to 6 mm long, the expanded petiole base is 2 mm wide.

The leafless flower stalks are erect, up to 3 cm (1.2 in) tall, with 2 to 4 involucres each with many flowers. The flower stalks are woolly-tomentose with stalked glands. Individual flower pedicels are smooth except for a few scattered glands at the base. The flowers are 2.5 to 3 mm long and sparsely glandular outside. Flower color varies from white to pink, turning orange and deep red at maturity.

This species resembles *Eriogonum gracilipes* S. Wats., but can be separated easily by the latter's longer glandular (not woolly-glandular) flower stalks 3 to 8 cm (1.2 to 3.2 in) long, inflorescences with 5 to 7 involucres, and pedicels glandular at the top. *E. kingii* Torr. & Gray which grows in the same area has greenish-yellow or pale yellow flowers which become tinged with red at maturity.

Flowering from June to August.

HABITAT: Crevices of rocks, on quartzite ridges, or with limestone boulders on talus slopes. Associated plants: *Primula nevadensis, Aquilegia scopulorum,* or *Penstemon francisci-pennellii.* Elevation: 3325-3600 m (10,900-11,800 ft).

KNOWN DISTRIBUTION: White Pine County, Nevada.

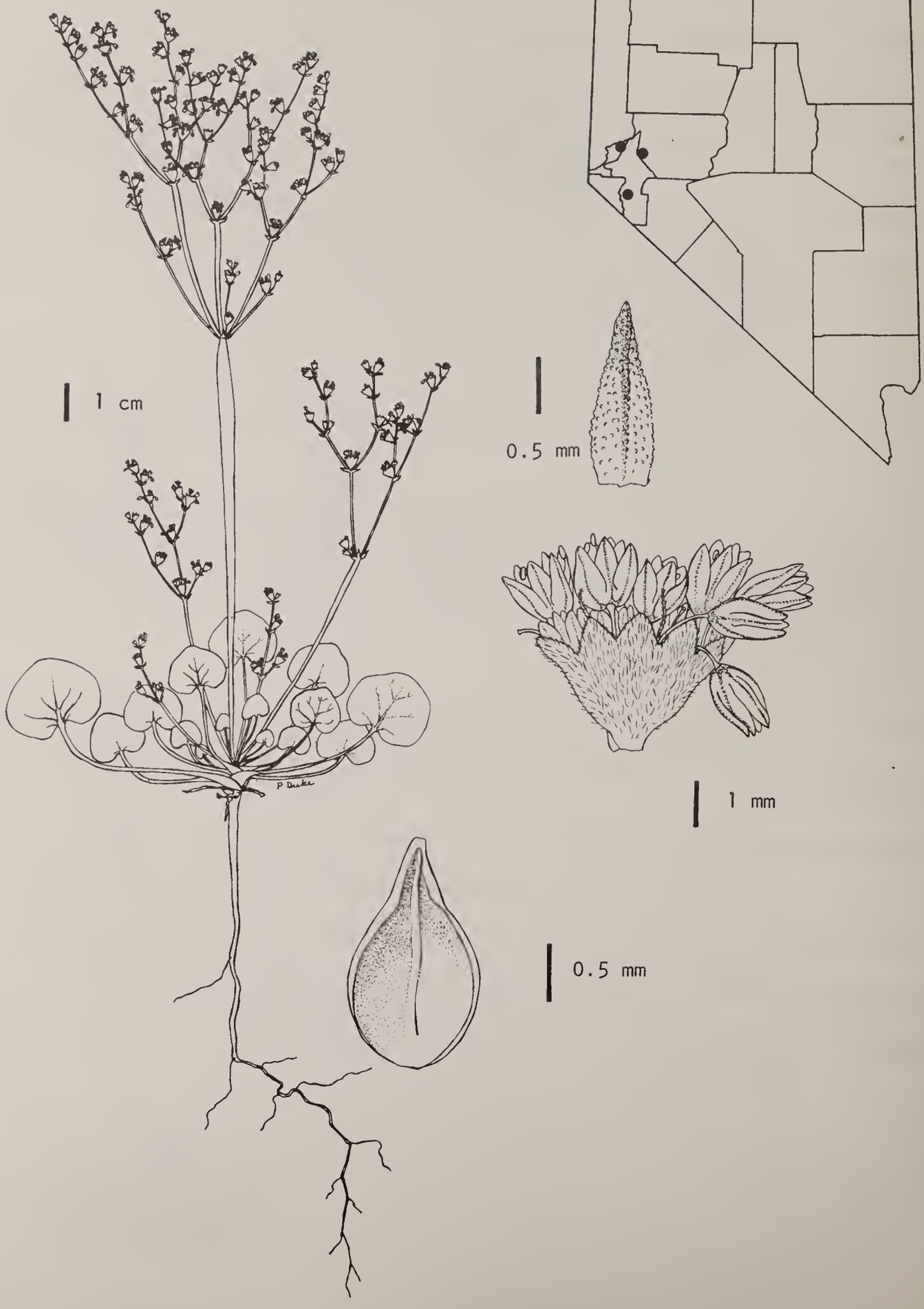
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Grazing by animals on unstable slopes.

REMARKS: More field work should be done to determine the full range of this buckwheat.

ERIOGONUM LEMMONII



ERIOGONUM LEMMONII S. Wats.
Lemmon Buckwheat

FAMILY: Polygonaceae -- Buckwheat Family

CITATION AND HISTORY: *Eriogonum lemmonii* S. Watson, Proceedings of the American Academy of Arts and Sciences, 12:266. 1876. Type: Lemmon, on sand hills and bare volcanic rocks, near Reno, Nevada, 1876. This taxon is named for J.G. Lemmon, the collector of the type specimen.

DESCRIPTION: An annual plant averaging 23 cm (9 in) high with a basal rosette of orbicular to reniform leaves which are somewhat pubescent with short, spreading hairs. The hollow stalk may be somewhat inflated.

The broad involucre is glandular-pubescent, 5 to 7 toothed, and 3 mm or less long. The flowers are pale rose-colored to yellowish and 1 to 2 mm long. The calyx is not stipe-like at the base.

This species can be separated from somewhat similar species found in the same area by its sessile, broad and glandular involucre and flowers which are not noticeably deflexed downwards. It can be easily separated from *E. rubricaule* Tidestr. by the latter's smooth involucre (or at most with a few hairs along the edges) and noticeably more branched inflorescence with much more slender branchlets.

Flowering in May and June.

HABITAT: Rolling hills, weathered lacustrine tuff; fine light colored sandy loams and silt loams are at the surface, grading to clay loam and clay in the lower horizons. Associated plants: *Eriogonum deflexum, E. inflatum, E. ochrocephalum* var., *E. rubricaule, Salvia dorrii, Atriplex confertifolia, Sarcobatus baileyi, Tetradymia glabrata, Oryzopsis hymenoides, Halogeton glomeratus, Salsola kali, Oenothera clavaeformis* var., and *Psathyrotes annua.* Elevation: 1280-1450 m (4200-4750 ft).

KNOWN DISTRIBUTION: Churchill, Lyon, and Storey counties, Nevada.

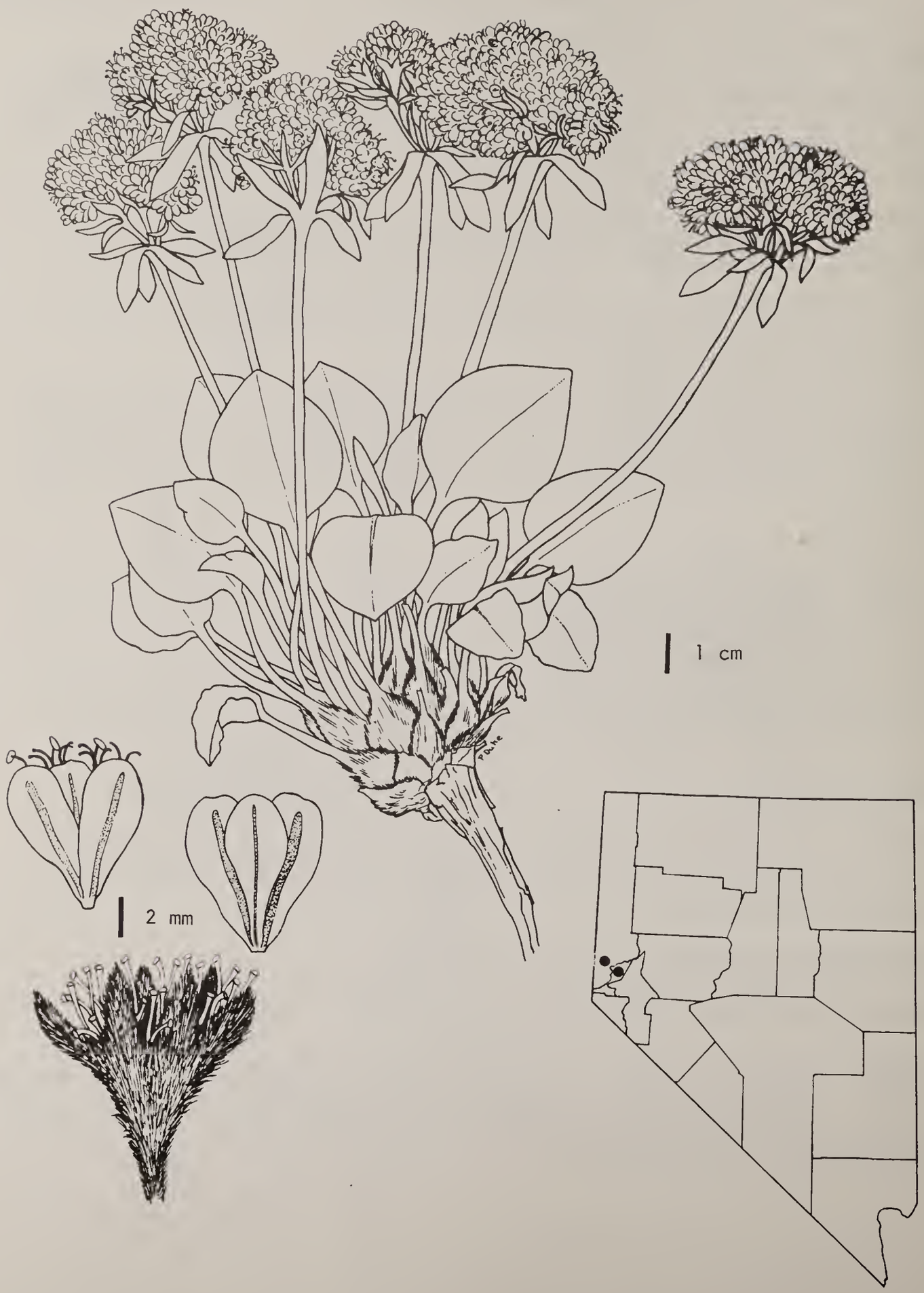
STATUS: Possibly extinct (1975 *FR*); endangered (1976 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; permit required for collection.

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Off-road vehicles. Other recreational use of the habitat.

REMARKS: *Eriogonum lemmonii* is an annual species which apparently only appears in favorable years. Plants were abundant in 1978 but were very scarce in 1979. The known populations should be monitored and this taxon should be searched for in similar habitats.

ERIOGONUM LOBBII var. ROBUSTUM



ERIOGONUM LOBBII T.&G. var. ROBUSTUM (Greene) Jones
Altered Andesite Buckwheat

FAMILY: Polygonaceae -- Buckwheat Family

CITATION AND HISTORY: *Eriogonum lobbii* var. *robustum* (Greene) Jones, Contributions to Western Botany, 11:7. 1903. Synonym: *Eriogonum robustum* Greene, Bulletin of the California Academy of Sciences, 1(3): 126. 1885. Type: Curran, Geiger Grade, Washoe County, Nevada, July 1884. The specific name, *robustum*, describes the robust habit of these plants.

DESCRIPTION: A many branched tufted perennial from a stout woody root-stock bearing round or oval leaves which are densely pubescent and have blades 1 to 4 cm (0.4 to 1.6 in) long on relatively long petioles.

The pubescent, leafless flower stalks are erect and about 15 cm (6 in) high and form a broad subdivided umbel. The main umbel is subtended by spatulate bracts, while the smaller umbellets are subtended by linear-lanceolate bracts.

The involucres are about 12 mm long and enclose cream-colored flowers about 6 mm long.

This variety is easily distinguished from the typical species by the latter's few branches, smaller size, and particularly by the prostrate, or nearly so, inflorescence stalks. There are no other eriogonums in the area with which this could easily be confused.

Flowering in May and June.

HABITAT: Barren altered andesite slopes. Associated plants: sagebrush-pinyon-juniper, *Pinus ponderosa*, and *P. jeffreyi* grow nearby. Elevation: 1310-1710 m (4300-5600 ft).

KNOWN DISTRIBUTION: Storey and Washoe counties, Nevada.

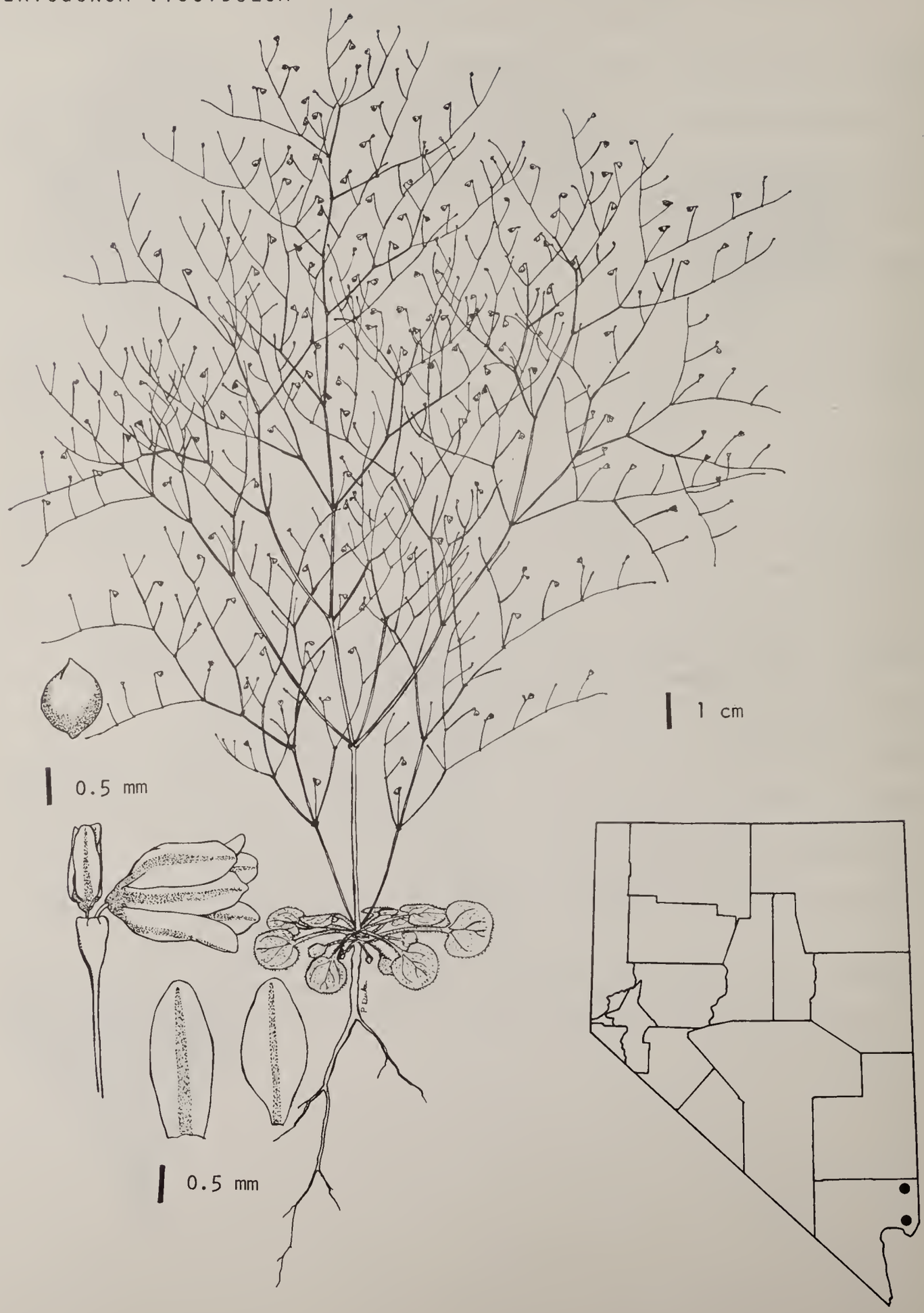
STATUS: Threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Land development for homesites. Off-road vehicles.

REMARKS: This buckwheat is apparently restricted to altered andesite soil and is only known from a limited area. Because of the rapid growth in population in this section of western Nevada, much of the suitable habitat is being destroyed.

ERIOGONUM VISCIDULUM



ERIOGONUM VISCIDULUM J.T. Howell
Sticky Buckwheat

FAMILY: Polygonaceae -- Buckwheat Family

CITATION AND HISTORY: *Eriogonum viscidulum* J.T. Howell, Leaflets of Western Botany, 3:138. 1942. Type: Eastwood and Howell, near Riverside, Virgin River, Clark County, Nevada, 8 May 1941. The common name and the specific name, *viscidulum*, refer to the sticky stems and branches of this species.

DESCRIPTION: An annual reaching 4 dm (16 in) in height, with the leaves all basal, and with the circular or reniforme blades pubescent beneath and thinly so or smooth above. The stems and branches are finely glandular to such an extent that sand and debris commonly adhere. Only the uppermost threadlike branches lack the glutinous covering.

The inflorescence is open and diffuse; the peduncles are slender and 0.5 to 2.5 cm long and smooth. The individual flowers are smooth to sparsely hairy, and yellowish.

This species may be easily distinguished from all related annual species by the glandular nature of the stem and branches.

Flowering in April and May.

HABITAT: Washes and flats in sandy soil. Associated plants: *Larrea tridentata, Ambrosia dumosa, Prosopis glandulosa, Psorothamnus fremontii, Eriogonum trichopes, Astragalus geyeri* var. *triquetrus, A. nyensis, A. nuttallianus* var. *imperfectus*, and *Oryzopsis hymenoides*. Elevation: 460-760 m (1500-2500 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

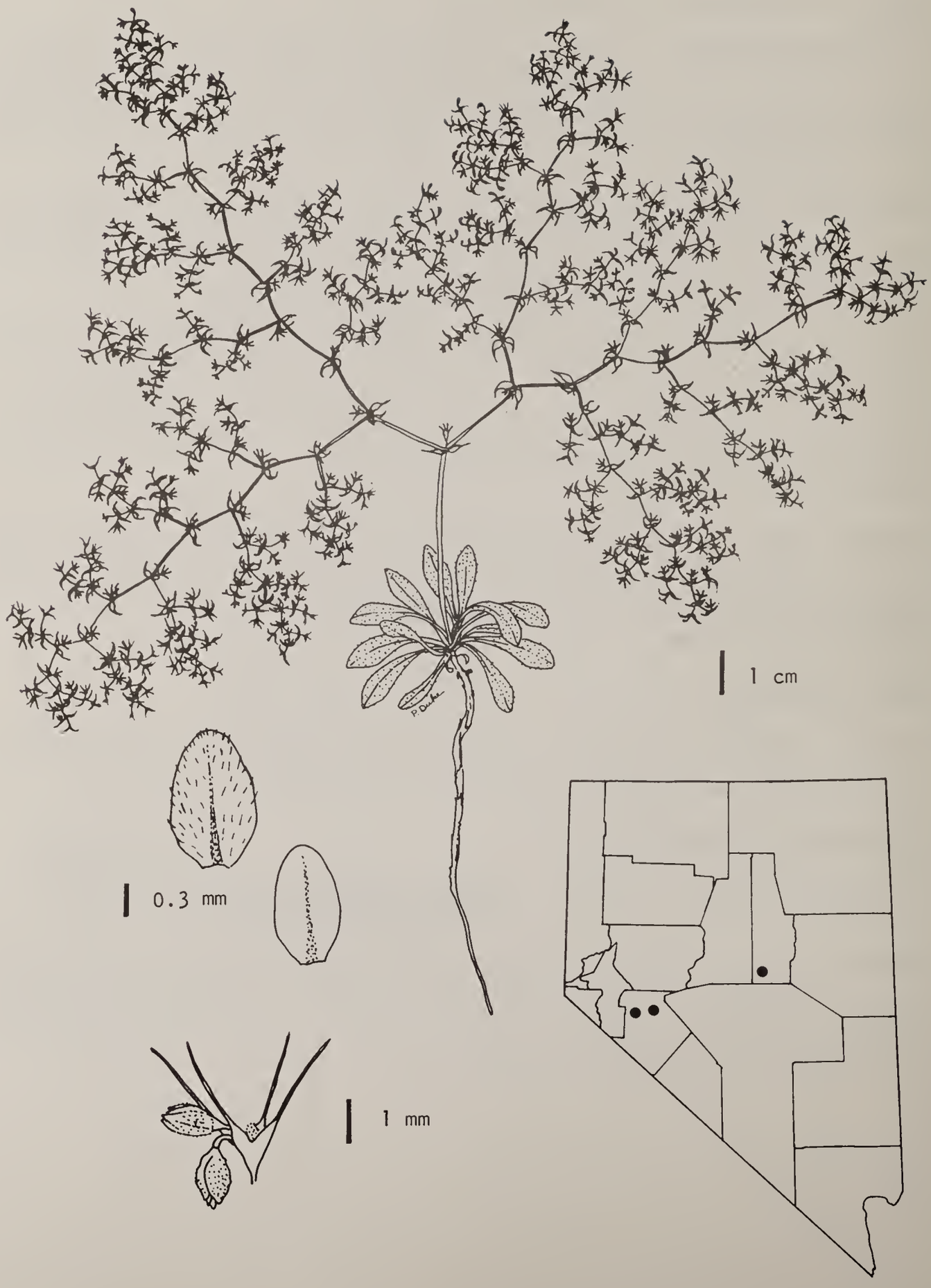
STATUS: Endangered (1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP/MANAGEMENT: BLM.

EXISTING OR POTENTIAL THREATS: Flooding and washouts. Commercial removal of sand and gravel. Proposed MX system.

REMARKS: Prior to 1979, *Eriogonum viscidulum* was only known from the type locality. Field study extended the range to several other nearby locations. However, this taxon is still limited in its distribution and known populations should be monitored. Because it is an annual, its occurrence may vary according to seasonal conditions.

OXYTHECA WATSONII



OXYTHECA WATSONII T.&G.
Watson Oxytheca

FAMILY: Polygonaceae -- Buckwheat Family

CITATION AND HISTORY: *Oxytheca watsonii* Torrey and Gray, Proceedings of the American Academy of Arts and Sciences, 8:191. 1870. Type: Watson, Monitor Valley, Nevada, 5500 ft, July 1868. The specific name, *watsonii*, and the common name both honor the collector of the type specimen, Sereno Watson.

DESCRIPTION: A small annual 10 to 25 cm (4 to 10 in) tall with a basal rosette of oblong-spatulate pubescent leaves 1.3 to 4 cm (0.5 to 1.6 in) long.

From the rosette arises the glandular flowering stem which characteristically branches into many smaller branches which digress from each other at wide angles. The bracts on the flowering stems are ovate or ovate-lanceolate and have a long awn at the tip. The bracts are typically fused at the base usually only on one side of the stem. Additional lobes may be present at the base of the bracts. The upper bracts are reduced in size. Generally three flowers are borne together and subtended by a funnel-shaped involucre composed of four fused bracts each of which is tipped with a long awn about 2 mm long. The flower has no petals, but only white petal-like sepals which are finely pubescent on the midvein.

The somewhat similar *Oxytheca dendroidea* Nutt. is easily separated by basal leaves which are narrowly linear to linear-oblanceolate rather than spatulate as in *O. watsonii*.

Flowering in June and possibly in July.

HABITAT: Alkali flats, gravelly washes; sometimes in sandy soil. Associated plants: *Atriplex* sp. Elevation: 1340-1980 m (4400-6500 ft).

KNOWN DISTRIBUTION: Eureka and Mineral counties, Nevada.

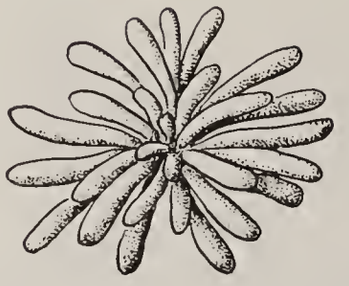
STATUS: Threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, USFS, and private.

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: One population was found growing with seeded crested wheat, so apparently this taxon can tolerate disturbance. *Oxytheca watsonii* has been very rarely collected and is never abundant at any one site.

LEWISIA MAGUIREI



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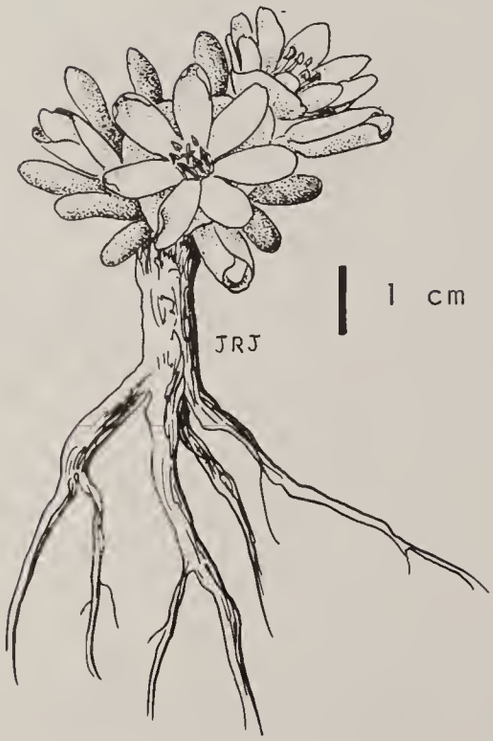

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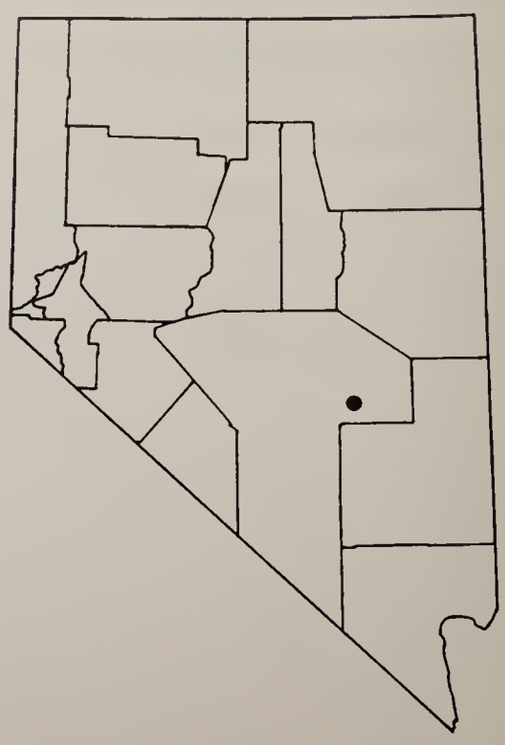


LEWISIA MAGUIREI Holmgren
Maguire Lewisia

FAMILY: Portulacaceae -- Purslane Family

CITATION AND HISTORY: *Lewisia maguirei* Holmgren, Leaflets of Western Botany, 7:136. 1954. Type: Maguire and Holmgren, Quinn Canyon Range, Nye County, Nevada, 7500 ft, 8 June 1945. This taxon is named for Bassett Maguire, one of the collectors of the type.

DESCRIPTION: A perennial with fleshy 1 to 2 cm (0.4 to 0.8 in) leaves at the top of a succulent branched taproot. The leaves and inflorescence are suffused with a rose color.

Two or three flowers are borne on each inflorescence stalk (rarely only one). The bracts subtending the main flower cluster are ovate and obtuse. The individual flower stalks are 3 to 9 mm long and are each subtended by a narrow linear oblong bract up to 10 mm long. There are 3 or 4 sepals and 7 to 9 white to pinkish petals about 8 to 12 mm long. The pistil has 4 to 6 styles and is surrounded by the 7 to 9 stamens.

The only other *Lewisia* found in this general area would be *L. rediviva* Pursh and this species can be readily distinguished by the linear-lanceolate and attenuate bracts found subtending the main flower clusters. *L. rediviva* also has larger flowers and never has more than one flower on each inflorescence stalk.

Flowering in June.

HABITAT: Limestone scree slopes, loose denuded soil. Associated plants: *Pinus monophylla, Juniperus osteosperma, Artemisia tridentata, Frasera albomarginata, Physaria chambersii, Hymenoxys acaulis,* and *Astragalus calycosus* var. *calycosus*. Elevation: 2285-2380 m (7500-7800 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

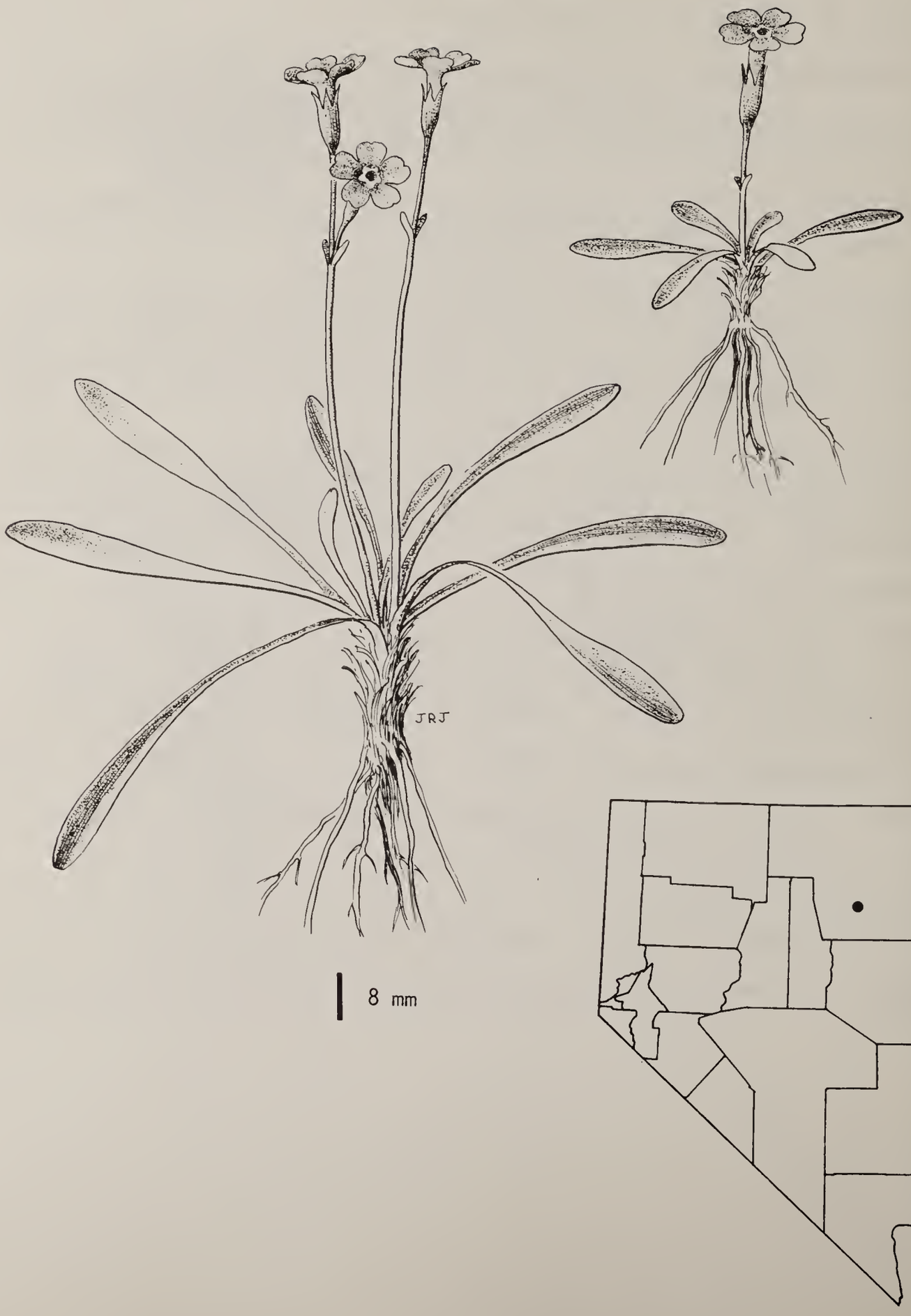
STATUS: Threatened (1975 *FR*); endangered (1976 *FR*); endangered (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Proposed MX system (indirectly).

REMARKS: This rare species should be searched for in other similar habitats.

PRIMULA CAPILLARIS



PRIMULA CAPILLARIS N. Holmgren & A. Holmgren
Ruby Mountains Primrose

FAMILY: Primulaceae -- Primrose Family

CITATION AND HISTORY: *Primula capillaris* N. Holmgren and A. Holmgren, Brittonia, 26:313. 1974. Type: N. Holmgren and Reveal, Ruby Mountains, Elko County, Nevada, 3000 m, 15 July 1965. The specific name, *capillaris*, describes the delicately small, narrow leaves and thin stems of this primrose which is the most diminutive in the United States.

DESCRIPTION: A small, delicate perennial herb 1 to 5 cm (0.4 to 2 in) high with linear or somewhat wider oblancolate leaves 1.8 to 5 cm (0.7 to 2 in) long which are gradually contracted into a winged petiole.

The leafless flower stalks bear one or rarely two flowers 14 to 36 mm (0.6 to 1.4 in) long. The corolla tube is yellow and the lobes are violet. The calyx is narrow and about 6 mm long.

This is the smallest of our primulas, *P. nevadensis* N. Holmgren is the only other small primrose in the state with which this might be confused. However, *P. nevadensis* has toothed leaves commonly overtopping the flower stalks which bear 1 to 8 flowers that are distinctly smaller (3 to 11 mm long).

Flowering in July and August.

HABITAT: Headwaters of a creek, granitic rock. Associated plants: grasses, *Selaginella watsonii*, *Potentilla fruticosa*, and *Pinus albicaulis*. Elevation: 2880-3000 m (9500-10,000 ft).

KNOWN DISTRIBUTION: Elko County, Nevada.

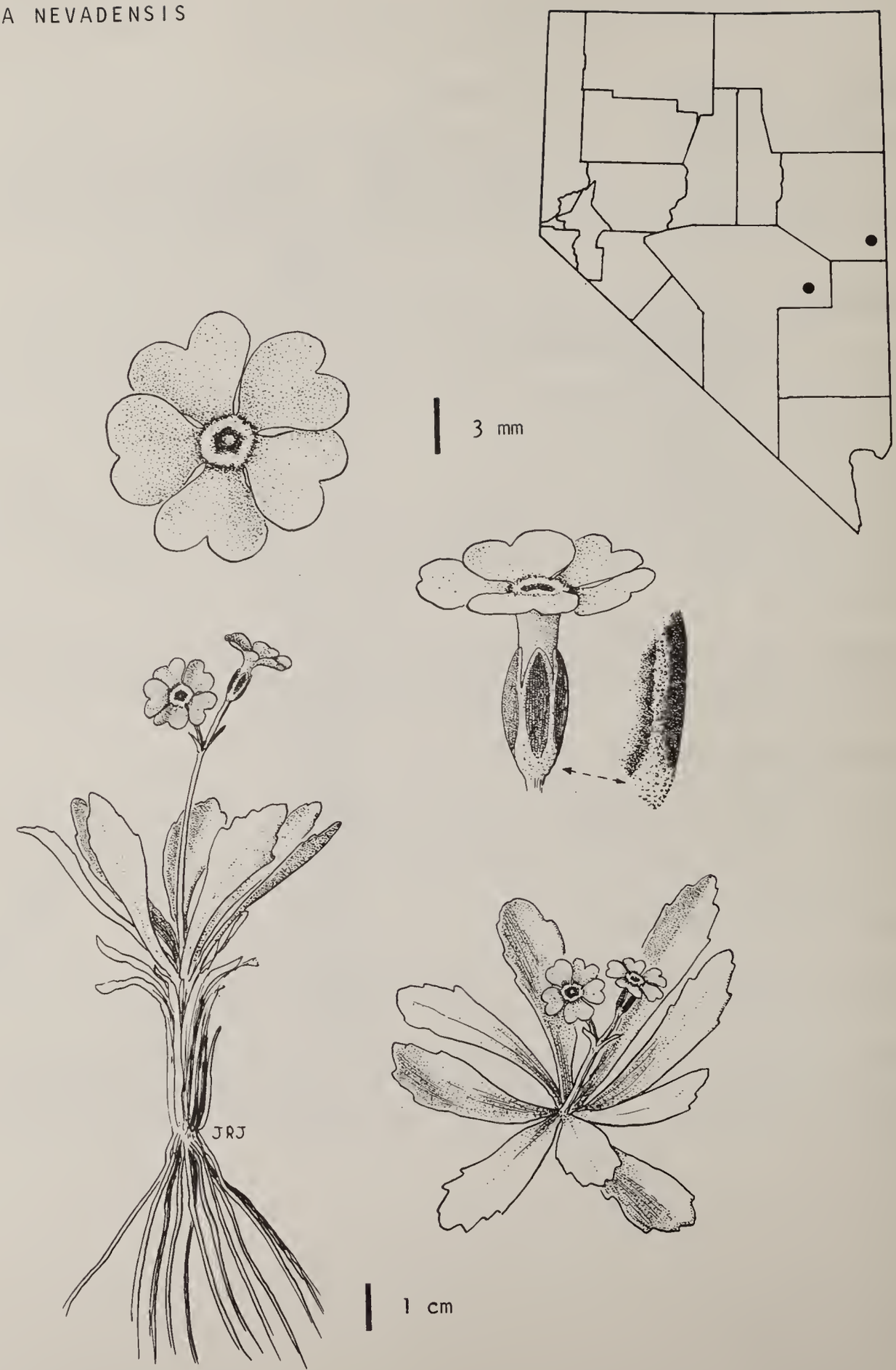
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Collection of plants for horticultural purposes. Grazing.

REMARKS: As far as is known, *Primula capillaris* has not been successful in cultivation. This primrose is only known from one small area, and, although this area is supposed to be closed to grazing, sheep have been in the area.

PRIMULA NEVADENSIS



PRIMULA NEVADENSIS N. Holmgren
Nevada Primrose

FAMILY: Primulaceae -- Primrose Family

CITATION AND HISTORY: *Primula nevadensis* N. Holmgren, Madroño, 19:27. 1967. Type: Holmgren, Reveal, and La France, Snake Range, White Pine County, Nevada, 11,500 ft, 20 July 1965. The specific name, *nevadensis*, refers possibly to the name of our state or to the snowy peaks where these primroses grow.

DESCRIPTION: A small perennial herbaceous plant with erect oblanceolate to linear oblanceolate minutely hairy and glandular leaves. The leaves are 5 to 10 cm (2 to 4 in) long and either coarsely toothed or entire.

The flower stalks are shorter than the leaves and bear an umbel of 1 to 8 flowers varying in size from 3 to 11 mm long. The violet corolla has a yellow throat and a dark purple ring around the throat. The anthers are yellow to yellow orange.

No other small *Primula* occurs in the area with which this might be confused. The common *P. parryi* Gray is a much larger plant with leaves up to 30 cm long.

Flowering in July and August.

HABITAT: Limestone cliffs and talus slopes. Associated plants: *Pinus longaeva, Aquilegia caerulea, Ribes montigenum, Heuchera parvifolia, Picea engelmannii,* or *Eriogonum holmgrenii*. Elevation: 3355-3505 m (11,000-11,500 ft).

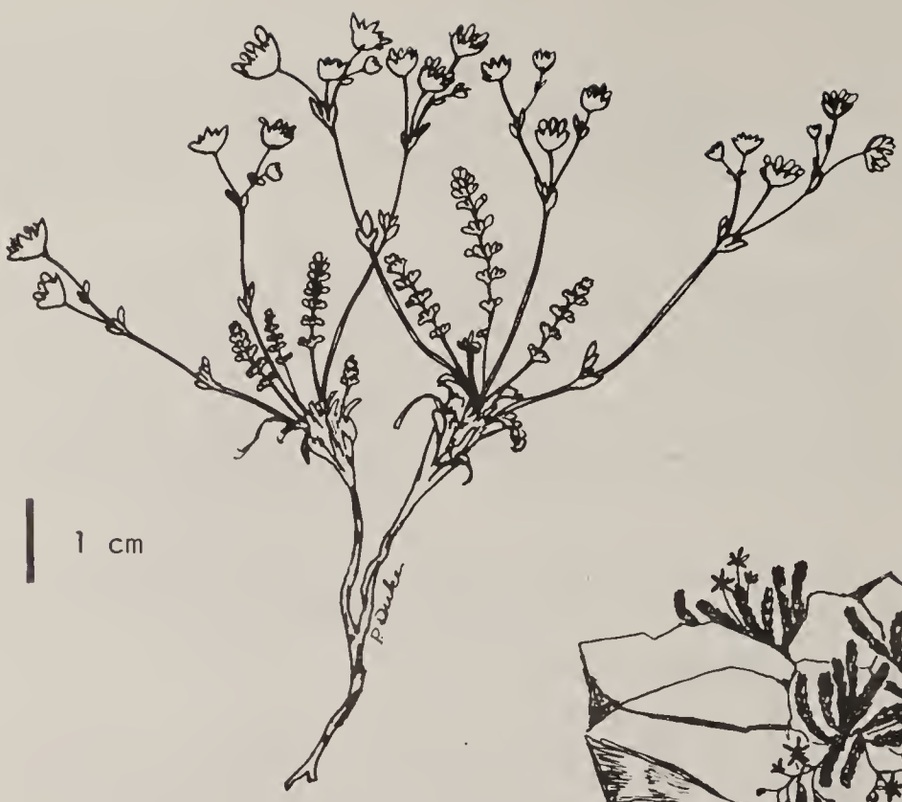
KNOWN DISTRIBUTION: Nye and White Pine counties, Nevada.

STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Mining activity. Removal of plants for horticultural purposes.

REMARKS: To our knowledge, *Primula nevadensis* has not been successfully cultivated. While it is not scarce at its known locations, it seems to require a unique habitat. It has been searched for in similar locations without success.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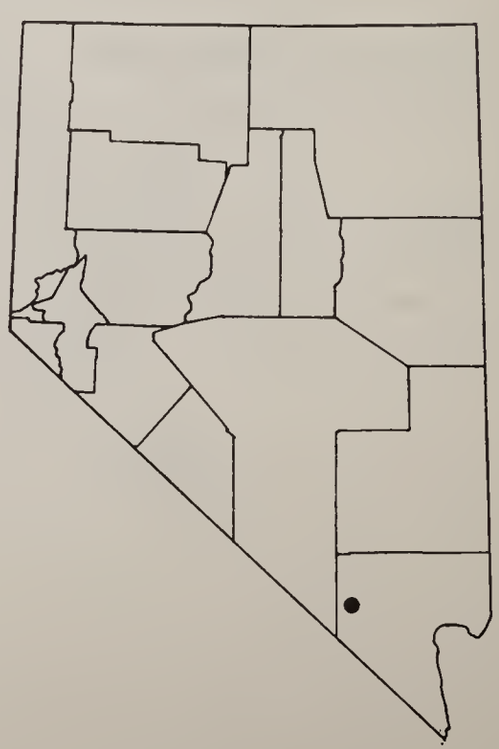


IVESIA CRYPTOCAULIS (Clokey) Keck
Charleston Ivesia

FAMILY: Rosaceae -- Rose Family

CITATION AND HISTORY: *Ivesia cryptocaulis* (Clokey) Keck, Lloydia, 1:130. 1938. Synonym: *Potentilla cryptocaulis* Clokey, Southern California Academy of Sciences Bulletin, 37:4. 1938. Type: Clokey, Charleston Peak, Clark County, Nevada, 3500 m, 8 July 1937. The specific name, *cryptocaulis*, refers to the hidden stems of the plants.

DESCRIPTION: A perennial with threadlike prostrate branches with ascending tips, 5 to 10 cm (2 to 4 in) long, forming a mat 2 to 3 cm (0.8 to 1.2 in) high. The stems and leaves are glandular and pubescent with fine, long hairs. The leaves are 1 to 2.5 cm long with 5 to 10 pairs of crowded leaflets, each 1.5 to 2.5 mm long.

The flat-topped inflorescence is few-flowered with yellow flowers producing narrow petals somewhat exceeding the sepals in length. There are 5 stamens and 6 to 10 pistils.

The achenes are smooth, compressed, and have a thickened ridge along one side, and are 1.4 to 1.8 mm long.

The related *Ivesia shockleyi* S. Wats. has smaller petals, less than 3.5 mm long, which are also shorter than the sepals, a smaller number of pistils (usually 3), and larger achenes which have an outgrowth on one side.

Flowering from June to August.

HABITAT: Flats and gravelly limestone slopes near timber-line. Associated plants: *Pinus longaeva, Sphaeromeria compacta, Draba jaegeri,* and *Aquilegia scopulorum.* Elevation: 3300-3500 m (10,820-11,480 ft).

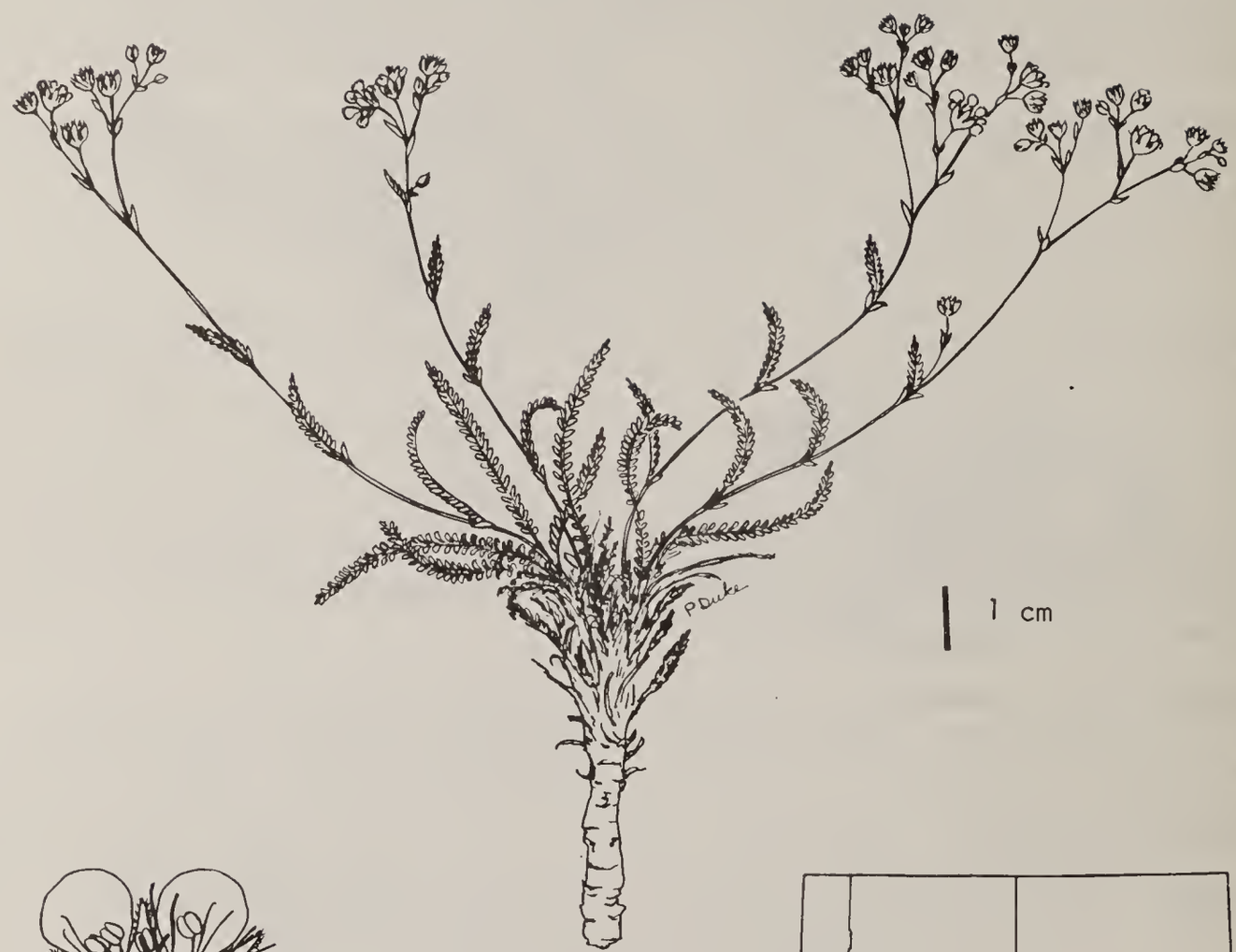
KNOWN DISTRIBUTION: Clark County, Nevada.

STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 9 Feb 1979); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Free roaming horses. Foot-traffic on unstable slopes. Proposed MX system (indirectly).

REMARKS: The expanding population in southern Nevada will increase the impact on the plants in the Spring Mountains.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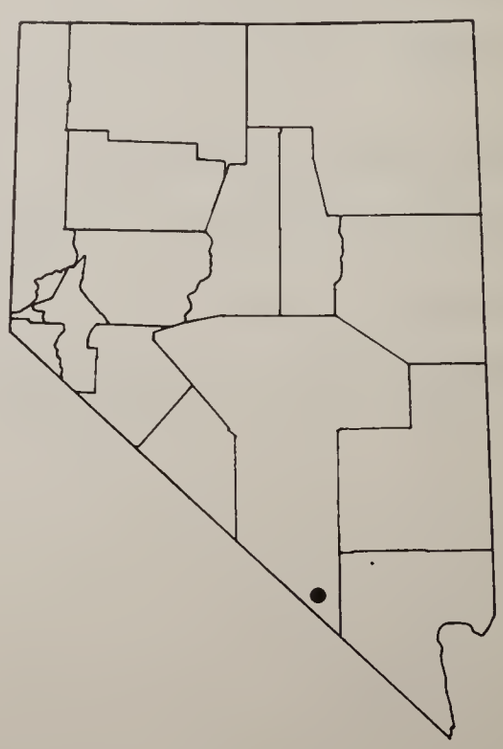
1 cm

2 mm



IVESIA EREMICA (Cov.) Rydb.
Ash Meadows Ivesia

FAMILY: Rosaceae -- Rose Family

CITATION AND HISTORY: *Ivesia eremica* (Cov.) Rydberg, North American Flora, 22: 286. 1908. Synonym: *Potentilla eremica* Cov., Proceedings of the Biological Society of Washington, 7:76. 1892. Type: Coville and Funston, Ash Meadows, Nye Co., Nevada, 740 m, 2 March 1891. The specific name comes from the Greek, *eremia*, meaning desert or wilderness.

DESCRIPTION: A perennial with a thick, woody root-crown bearing a tuft of grayish, pubescent leaves (which are sometimes nearly hairless) which reach a length of 13 cm (5.2 in). Each pinnately compound leaf bears up to 60 pairs of leaflets about 2 to 2.5 mm wide.

The few flowered inflorescence bears white flowers with calyx segments 3 to 4 mm long and petals which are about 2 mm longer.

The grayish, pinnately divided narrow leaves make this a distinctive plant not easily confused with anything else in its locale. It resembles the more widespread *Ivesia kingii* S. Wats., but differs significantly in its pubescent aspect, while the latter species is quite hairless. Additionally the leaves of *I. kingii* are only half as long and bear only 20 to 25 pairs of leaflets.

Flowering from August to October.

HABITAT: Light-colored clay uplands, saline seep areas. Associated plants: *Atriplex confertifolia, Haplopappus acradenius, Distichlis spicata* var. *stricta, Spartina gracilis,* or *Juncus* sp. Elevation: 670-700 m (2190-2300 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

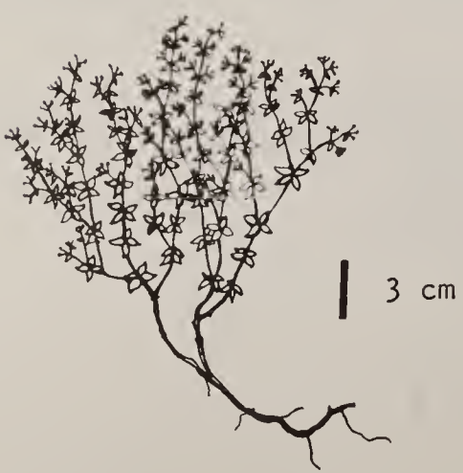
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 November 1979).

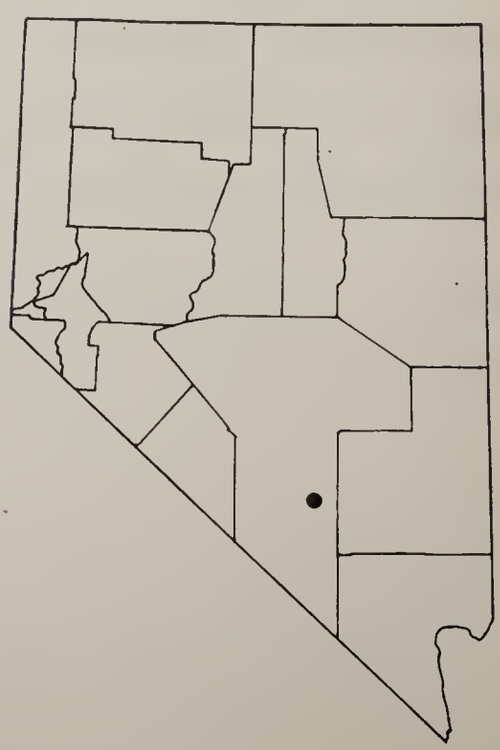
LAND OWNDERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Utilization of land for agricultural or other developmental purposes. Destruction by free roaming horses. Dust from disturbed soil may smother plants. Proposed MX system (indirectly).

REMARKS: *Ivesia eremica* has such a limited distribution, any loss of habitat is critical. These plants are apparently limited to a specialized edaphic situation.

GALIUM HILENDIAE var. KINGSTONENSE





GALIUM HILENDIAE Dempst. & Ehrend. ssp. KINGSTONENSE (Dempst.) Dempst. & Ehrend.
KINGSTON BEDSTRAW

FAMILY: Rubiaceae -- Madder Family

CITATION AND HISTORY: *Galium hilendiae* ssp. *kingstonense* (Dempst.) Dempst. & Ehrend., Brittonia, 17:310. 1965. Synonym: *Galium munzii* var. *kingstonense* Dempst., Brittonia, 10:190. 1958. Type: Alexander and Kellogg, San Bernardino County, California, 16 June 1941. The common name and the name of the subspecies were both taken from Kingston Peak near where the type was collected.

DESCRIPTION: A dioecious, mat-forming, weak-stemmed perennial to 35 cm (14 in) long with stems and leaves which are pubescent with stiff, bristly hairs. The leaves are 4 to a node and wide to narrowly ovate-acuminate, 6 to 15 mm long, and one-nerved.

Flowers are in congested terminal clusters. Each individual flower is relatively large for the genus, with a corolla about 3 mm long, clear pink and bell-shaped.

The fruit is about 2 mm long and densely white pubescent.

This is easily recognized, distinguished especially by the large, bell-shaped pink flowers in dense terminal clusters. *Galium hilendiae* ssp. *carneum* (Hilend & Howell) Dempst. & Ehrend. differs in that it is taller, more wiry with a loose inflorescence, and pistillate flowers that are open and wheel-shaped. The male flowers are only slightly bell-shaped.

Flowering in June.

HABITAT: In ravines and gullies, usually on steep slopes, in loose rocky soil. Associated plants: *Pinus monophylla, Quercus gambelii, Artemisia tridentata,* and *A. ludoviciana* ssp. *incompta.* Elevation: 1680-1980 m (5500-6500 ft).

KNOWN DISTRIBUTION: Nye County, Nevada. San Bernardino and Inyo counties, California.

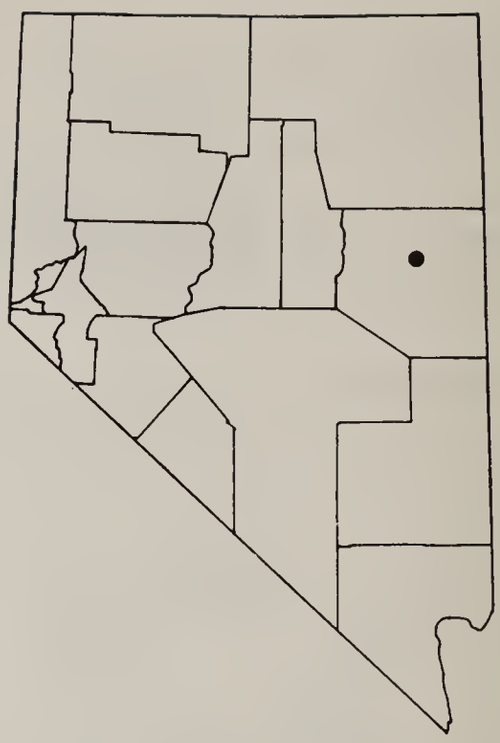
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979); threatened (Mozingo and Williams).

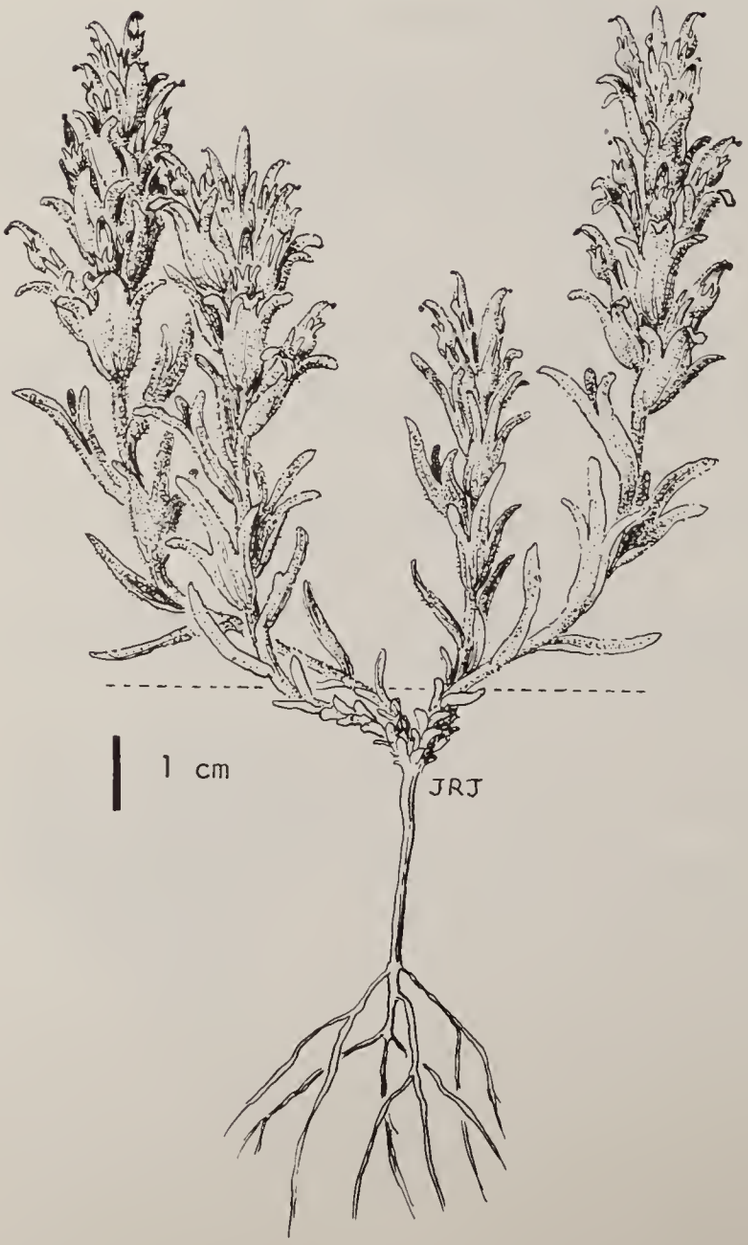
LAND OWNERSHIP/MANAGEMENT: DOE (Nevada Test Site).

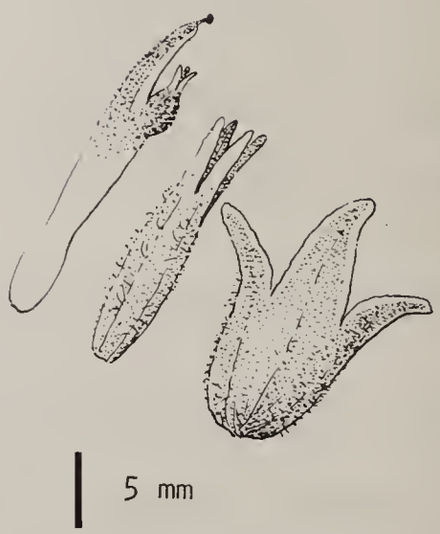
EXISTING OR POTENTIAL THREATS: Slides on unstable talus slopes.

REMARKS: The known populations of this rare taxon should be monitored and it should be searched for in similar locations.

CASTILLEJA SALSUGINOSA







CASTILLEJA SALSUGINOSA N. Holmgren
Monte Neva Paintbrush

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Castilleja salsuginosa* N. Holmgren, Bulletin of the Torrey Botanical Club, 100:83. 1973. Type: Holmgren and Reveal, Monte Neva Hot Springs, White Pine County, Nevada, 4 July 1966. The specific name, *salsuginosa*, means growing in brackish places.

DESCRIPTION: A several stemmed perennial to 14 cm (5.6 in) in height with a soft scaly root-stock and yellow taproot. The leaves are pubescent with stiff hairs, many of which are tipped with glands. The lower leaves just above the soil level are linear to narrow-lanceolate, while those further up the stem are typically narrow-lanceolate with a pair of lateral lobes. The leaves are basically purplish-brown but may appear grayish because of debris which sticks to the plant.

The margins of the inflorescence bracts are white or cream-colored. Similar margins exist on the calyx teeth and the teeth of the lower lip of the corolla. The upper elongated portion of the corolla has a reddish margin.

The capsules are 5.5 to 9 mm long and produce 1.5 mm long seeds with a network on the surface.

The only other species of this genus to be found in alkaline soils in Nevada is *Castilleja exilis* A. Nels., which is an annual plant possessing larger leaves (4 to 8 cm compared to 1.5 to 2.4 cm) which are wider and lanceolate in shape. The calyx teeth in *C. exilis* are much shorter than those of *C. salsuginosa* (1 to 2 mm compared to 6 to 8.5 mm) and the corolla in the former is also shorter (16 to 18 mm compared to 18 to 22 mm).

Flowering in June and July.

HABITAT: Damp, saline clay soil, on hummocks and sides of the shallow washes draining the mineral spring. Associated plants: *Distichlis spicata* var. *stricta*, *Dodecatheon pauciflorum*, *Eriogonum shockleyi*, *Hesperochiron californicus*, *Ivesia kingii*, *Leptodactylon caespitosum*, and *Phlox kelseyi* var. *salina*. Elevation: 1830 m (6000 ft).

KNOWN DISTRIBUTION: White Pine County, Nevada.

STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP/MANAGEMENT: Private.

EXISTING OR POTENTIAL THREATS: Geothermal drilling or development of the hot springs as a recreation area or any other land use change which would cause a depletion of the water supply. Proposed MX system.

REMARKS: This paintbrush has been searched for in other similar habitats, but it is still only known from the type locality. Apparently it is restricted to this one particular edaphic situation. Care must be taken to preserve this habitat.

CORDYLANTHUS TECOPENSIS

CASTILLEJA SALSUGINOSA N. Holmgren
Monte Neva Paintbrush

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Castilleja salsuginosa* N. Holmgren, Bulletin of the Torrey Botanical Club, 100:83. 1973. Type: Holmgren and Reveal, Monte Neva Hot Springs, White Pine County, Nevada, 4 July 1966. The specific name, *salsuginosa*, means growing in brackish places.

DESCRIPTION: A several stemmed perennial to 14 cm (5.6 in) in height with a soft scaly root-stock and yellow taproot. The leaves are pubescent with stiff hairs, many of which are tipped with glands. The lower leaves just above the soil level are linear to narrow-lanceolate, while those further up the stem are typically narrow-lanceolate with a pair of lateral lobes. The leaves are basically purplish-brown but may appear grayish because of debris which sticks to the plant.

The margins of the inflorescence bracts are white or cream-colored. Similar margins exist on the calyx teeth and the teeth of the lower lip of the corolla. The upper elongated portion of the corolla has a reddish margin.

The capsules are 5.5 to 9 mm long and produce 1.5 mm long seeds with a network on the surface.

The only other species of this genus to be found in alkaline soils in Nevada is *Castilleja exilis* A. Nels., which is an annual plant possessing larger leaves (4 to 8 cm compared to 1.5 to 2.4 cm) which are wider and lanceolate in shape. The calyx teeth in *C. exilis* are much shorter than those of *C. salsuginosa* (1 to 2 mm compared to 6 to 8.5 mm) and the corolla in the former is also shorter (16 to 18 mm compared to 18 to 22 mm).

Flowering in June and July.

HABITAT: Damp, saline clay soil, on hummocks and sides of the shallow washes draining the mineral spring. Associated plants: *Distichlis spicata* var. *stricta*, *Dodecatheon pauciflorum*, *Eriogonum shockleyi*, *Hesperochiron californicus*, *Ivesia kingii*, *Leptodactylon caespitosum*, and *Phlox kelseyi* var. *salina*. Elevation: 1830 m (6000 ft).

KNOWN DISTRIBUTION: White Pine County, Nevada.

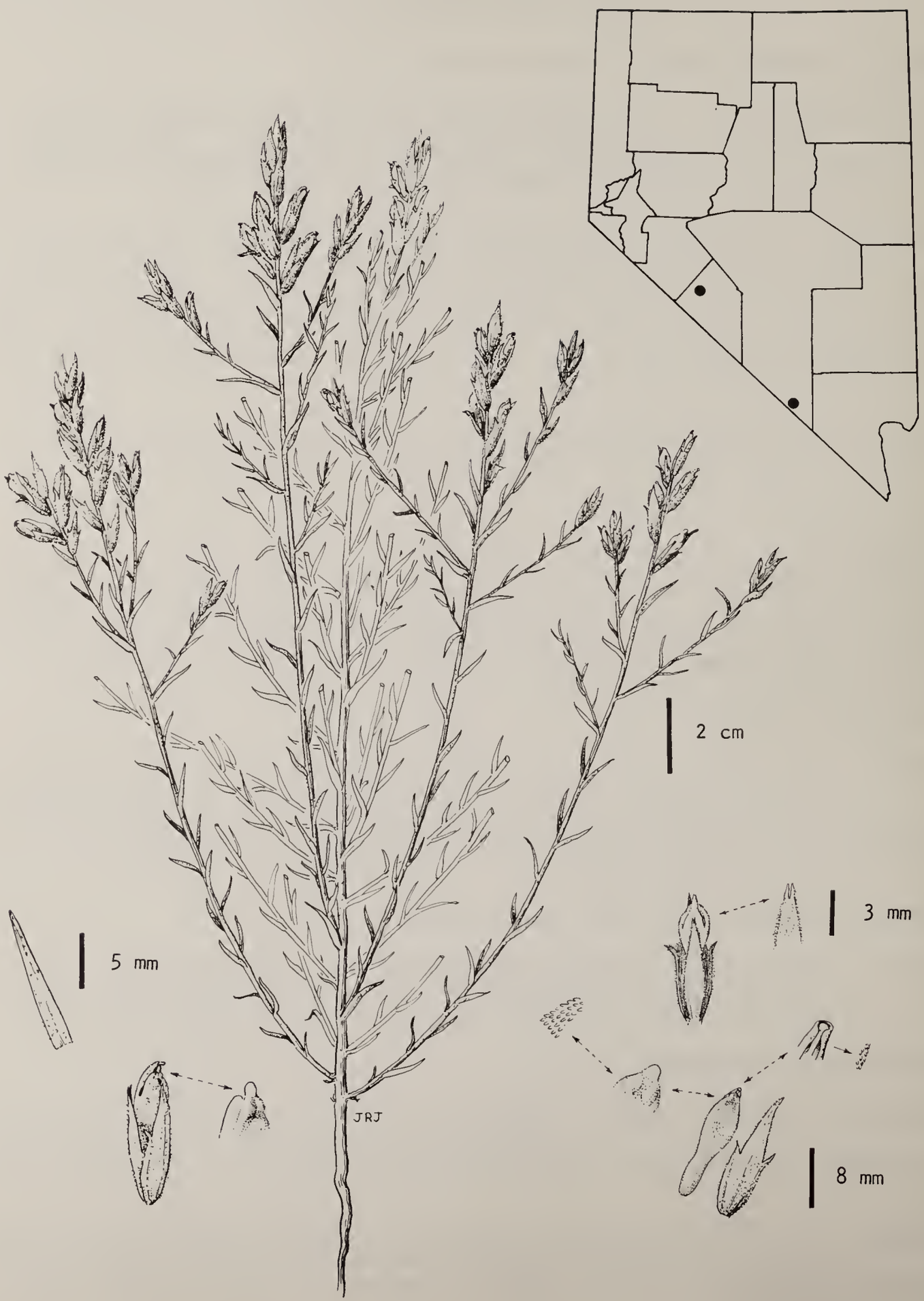
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required.

LAND OWNERSHIP/MANAGEMENT: Private.

EXISTING OR POTENTIAL THREATS: Geothermal drilling or development of the hot springs as a recreation area or any other land use change which would cause a depletion of the water supply. Proposed MX system.

REMARKS: This paintbrush has been searched for in other similar habitats, but it is still only known from the type locality. Apparently it is restricted to this one particular edaphic situation. Care must be taken to preserve this habitat.

CORDYLANTHUS TECOPENSIS



CORDYLANTHUS TECOPENSIS Munz & Roos
Tecopa Bird's-beak

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Cordylanthus tecopensis* Munz & Roos, Aliso, 2:233. 1950. Type: Munz and Campbell, Tecopa Hot Springs, Inyo County, California, 1400 ft, 9 October 1949. This species was named for Tecopa Hot Springs, the location of the type collection.

DESCRIPTION: An annual plant 15 to 30 cm (6 to 12 in) tall with few to many ascending branches and linear-lanceolate to awl shaped leaves 5 to 15 mm long and 1 to 2 mm broad. The leaves are sparsely pubescent with small hairs. Many of the branches terminate in an inflorescence with three lobed floral bracts, with the lateral lobes being 2 to 3 mm long and linear-lanceolate.

The pale lavender corolla is 10 to 15 mm long and exceeds the floral bracts and calyx. There are two functional stamens each with bearded anther sacs.

An oblong capsule about 7 mm long is eventually produced.

From the similar *Cordylanthus maritimus* Nutt. ssp. *canescens* (Gray) Chuang & Heckard, this species can be distinguished by two rather than four functional stamens and a pair of lobes arising from a median position on the floral bract rather than two short teeth arising from near the apex.

Flowering from June to October.

HABITAT: Salt-encrusted clay soils, saline meadows. Associated plants: *Distichlis spicata* var. *stricta*, *Haplopappus acradenius*, *Atriplex confertifolia*, *Cordylanthus maritimus* ssp. *canescens*, *Juncus* sp., *Eleocharis* sp., and *Centaurium* sp. Elevation: 425-1465 m (1400-4800 ft).

KNOWN DISTRIBUTION: Esmeralda and Nye counties, Nevada. Inyo County, California. Harney County, Oregon.

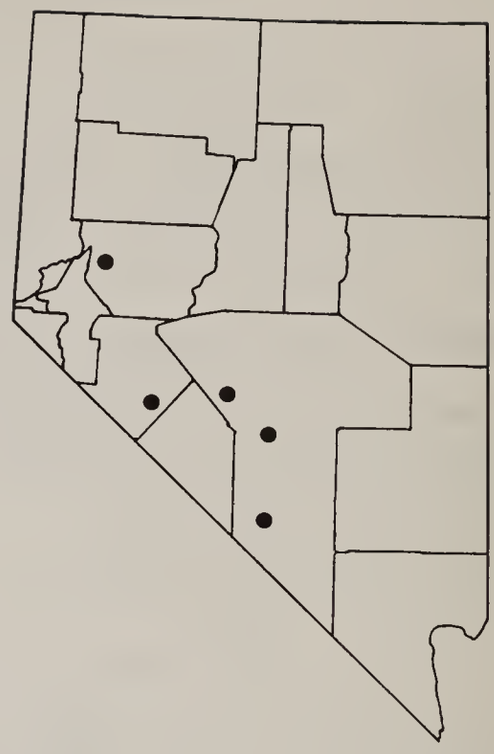
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Any land use change, such as development, which will cause a change in the available water. Proposed MX system (indirectly).

REMARKS: *Cordylanthus tecopensis* is apparently restricted to a particular edaphic situation. However, it is proving to be more widely distributed than was originally thought.

PENSTEMON ARENARIUS



1 cm

2 mm

PENSTEMON ARENARIUS Greene
Dune Penstemon

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Penstemon arenarius* Greene, Pittonia, 1:282. 1889. Synonym: *Penstemon deustus* var. *arenarius* W.L. Jepson, Manual of the Flowering Plants of California, p. 916. 1951. Type: Shockley Belleville, Esmeralda (now Mineral) County, Nevada, 22 May 1886. The specific name, *arenarius*, means growing on sand.

DESCRIPTION: A subshrubby perennial with many branches reaching a height of 3 dm (12 in) and producing lanceolate, coarsely toothed leaves which are strongly glandular-pubescent. The stem leaves are 2.5 to 5 cm (1 to 2 in) long and sessile.

The inflorescence is short and leafy bracted and supports yellowish-white flowers marked with purple lines. The corolla is about 12 mm long and narrowly funnelform with short, spreading lobes. The calyx lobes are lanceolate, and along with the corolla strongly glandular-pubescent. The sterile stamen is heavily bearded at the tip.

This species resembles *P. deustus* Dougl. but differs primarily in its conspicuous glandular pubescence. This feature, along with the bearded sterile stamen and circular anther sacs, serves to separate *P. arenarius* from similarly colored species likely to be found in the same area.

Flowering in May and June.

HABITAT: Sandy areas, sometimes with dark gravel pavement. Associated plants: *Atriplex canescens, Tetradymia glabrata, Sarcobatus vermiculatus, Psorothamnus polydenius, Oryzopsis hymenoides, Oenothera deltoides,* or *Nama demissum.* Elevation: 1215-1340 m (3990-4400 ft).

KNOWN DISTRIBUTION: Churchill, Mineral, and Nye counties, Nevada.

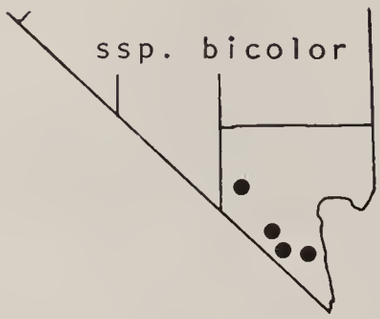
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

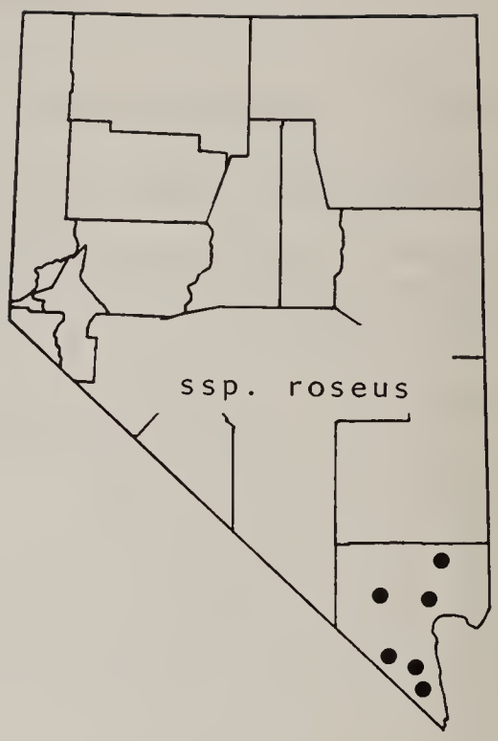
LAND OWNERSHIP/MANAGEMENT: BLM and private.

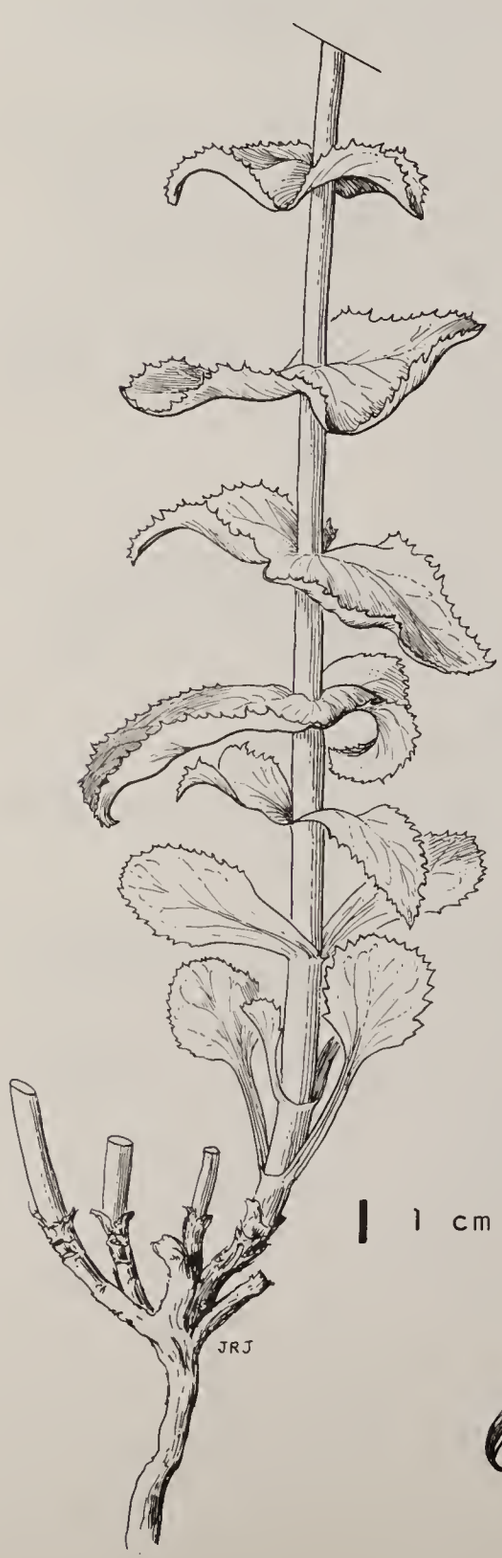
EXISTING OR POTENTIAL THREATS: Grazing and trampling by cattle. Geothermal development. Proposed MX system.

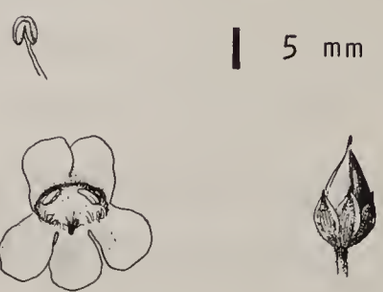
REMARKS: While *Penstemon arenarius* has a wide distribution, it is not abundant at any one site.

PENSTEMON BICOLOR









PENSTEMON BICOLOR (Bdg.) Clokey & Keck ssp. BICOLOR
PENSTEMON BICOLOR ssp. ROSEUS Clokey & Keck
Bicolored Penstemon

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Penstemon bicolor* (Bdg.) Clokey & Keck ssp. *bicolor*, Bulletin of the Southern California Academy of Sciences, 38:8. 1939. Synonyms: *P. palmeri* var. *bicolor* T.S. Brandegee, University of California Publications in Botany, 6:360. 1916. *P. pseudospectabilis* ssp. *bicolor* (Bdg.) Keck, American Midland Naturalist, 18:790. 1937. Type: K. Brandegee, Goodsprings, Clark County, Nevada, May 1916.

P. bicolor ssp. *roseus* Clokey & Keck, Bulletin of the Southern California Academy of Sciences, 38:8. 1939. Type: Clokey, Nelson, Clark Co., NV, 600 m, May 1938. The flowers of these penstemons can be yellow or pink, hence the name.

DESCRIPTION: A tall (to 12 dm or 48 in) perennial with thick stems and grayish, smooth, leathery leaves. The leaves are irregularly toothed with the basal leaves petiolated and the upper ones sessile and clasping the stem.

The inflorescence is strongly glandular-pubescent and bears light yellow (ssp. *bicolor*) or pink to purplish-pink (ssp. *roseus*) flowers which are abruptly inflated above the basal portion. The flowers may be somewhat glandular pubescent within and are usually sparsely long-pubescent across the base of the lobes of the lower lip. The lips are 4.5 to 7 mm long. The sterile stamen is longer than the corolla and is prominently bearded with long yellow hairs.

The only apparent significant difference between the two subspecies is in the flower color. *P. palmeri* Gray is similar but it has a corolla which is whitish suffused with pink or lilac.

Flowering in May and June.

HABITAT: On slight elevations, in shallow gravelly washes, roadside. Associated plants: *Larrea tridentata, Yucca brevifolia, Stephanomeria pauciflora,* and *Hymenoclea salsola.* Elevation: 600-1670 m (1970-5480 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. Arizona.

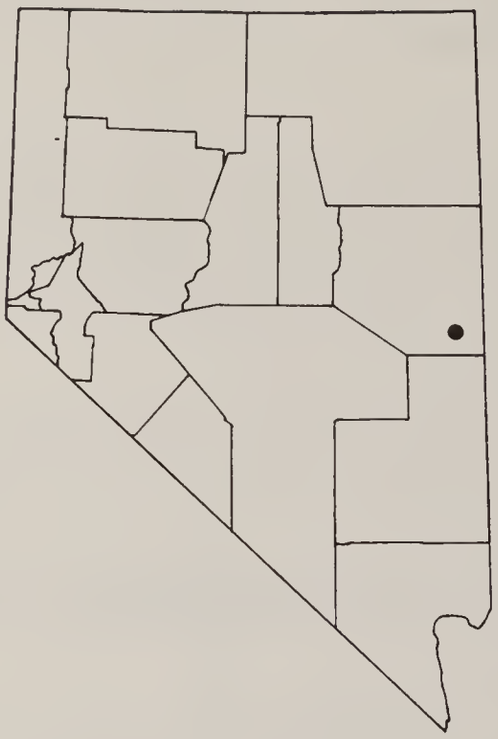
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

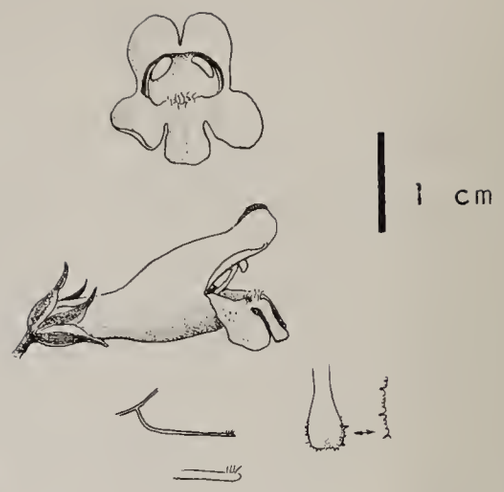
LAND OWNERSHIP/MANAGEMENT: BLM and private.

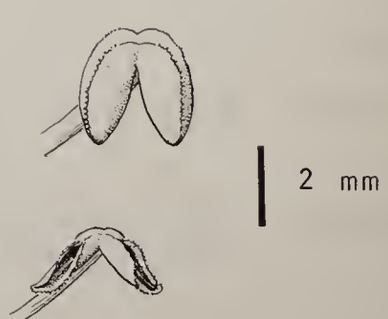
EXISTING OR POTENTIAL THREATS: Collectors for horticultural purposes. Feral burros. Proposed MX system (indirectly).

REMARKS: These taxa appear to thrive in disturbed areas. Both color forms have been widely collected.

PENSTEMON FRANCISCI-PENNELLII







PENSTEMON FRANCISCI-PENNELLII Crosswhite
Pennell Penstemon

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Penstemon francisci-pennellii* Crosswhite, Leaflets of Western Botany, 10:170. 1965. Type: Pennell and Schaffer, Snake Range, White Pine County, Nevada, 10,200-10,500 ft, 16 July 1938. The specific name, *francisci-pennellii*, and the common name both honor Francis Pennell, one of the collectors of the type.

DESCRIPTION: A perennial with narrow (2 mm) stems to 2.5 dm (10 in) high, with opposite, entire, smooth to slightly pubescent, and somewhat glaucous leaves. The stem leaves are linear-lancolate and 11 to 47 mm (0.4 to 1.9 in) long.

The inflorescence is sparingly glandular-pubescent, with flower stalks generally less than 10 mm long. The individual flowers are blue or blue-purple and 27 to 34 mm (1.1 to 1.4 in) long. The narrow base of the corolla is expanded into a wide upper portion or "throat." The lower petal lobe is bearded with short, curly, white hairs. The sepals are green, sometimes with a clear margin and 6 to 8 mm long.

Mature capsules are 7 to 12 mm long and produce seeds about 2 mm long.

The large seeds, expanded throat, linear-lanceolate stem leaves, and slight or absent pubescence serve to separate this species from any related forms which may be found in the same area.

Flowering in July and August.

HABITAT: Rocky calcareous slopes, shaded banks. Associated plants: *Pinus flexilis*, *Picea engelmannii*, *Populus tremuloides*, *Aquilegia caerulea*, *Potentilla glandulosa*, and *Heuchera parviflora* var. *utahensis*. Elevation: 2590-3355 m (8500-11,000 ft).

KNOWN DISTRIBUTION: White Pine County, Nevada.

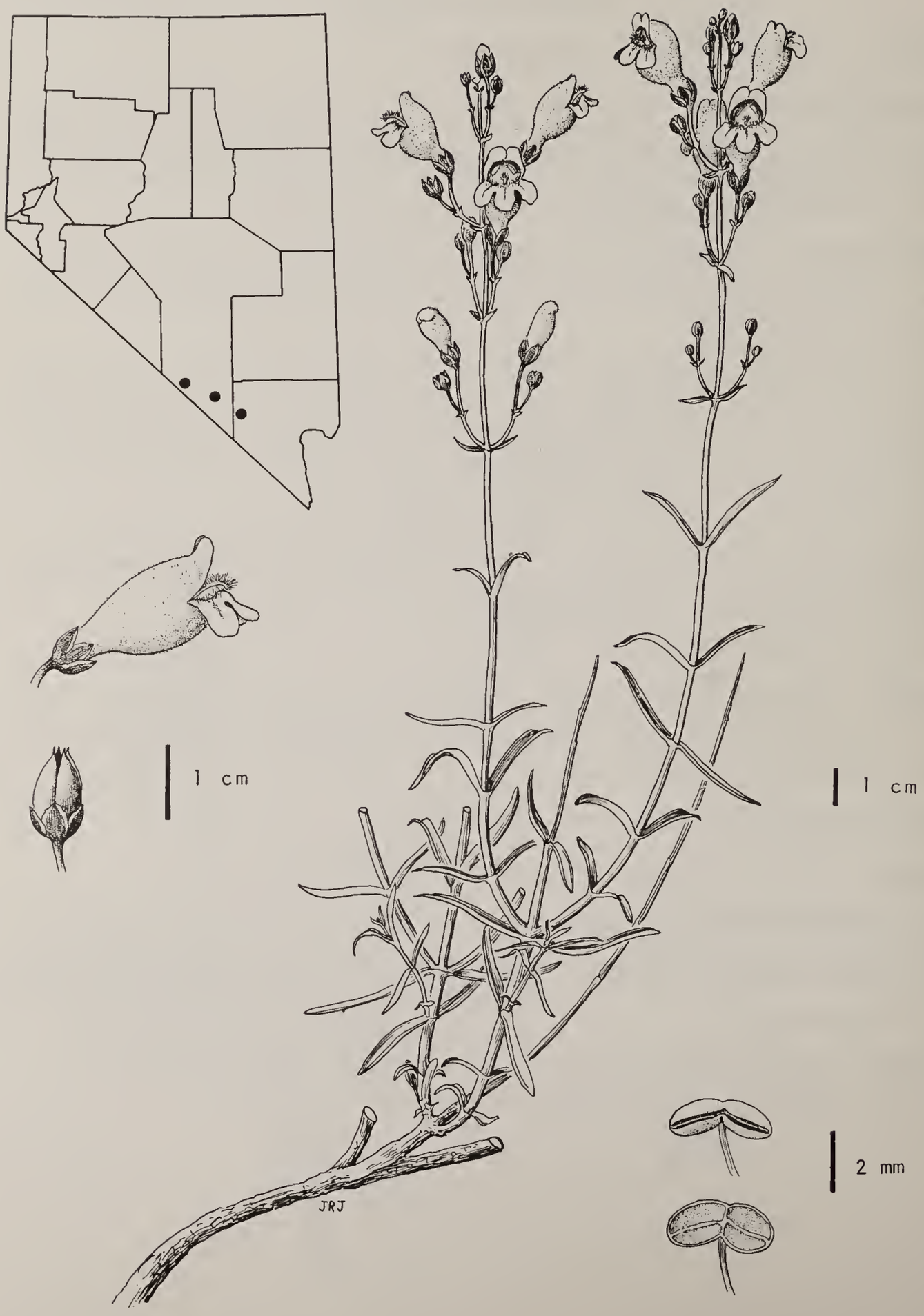
STATUS: Threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Heavy recreational use of some areas where this taxon is found. Proposed MX system (indirectly).

REMARKS: An effort should be made to determine if *Penstemon francisci-pennellii* is more widely distributed.

PENSTEMON FRUTICIFORMIS ssp. AMARGOSAE



PENSTEMON FRUTICIFORMIS Cov. ssp. AMARGOSAE Keck
Amargosa Penstemon

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Penstemon fruticiformis* ssp. *amargosae* Keck, The American Midland Naturalist, 18:801. 1937. Type: M.E. Jones, Amargosa Desert, Nye County, Nevada, 1220 m, 27 April 1907. The specific name, *amargosae*, and the common name were taken from the name of the desert where the type was collected.

DESCRIPTION: A perennial with many branches from a shrubby base attaining a height of 6 dm (2 ft). The leaves are usually entire or rarely slightly toothed, and linear-lanceolate to 6 mm wide. The margins tend to be curled upwards. The lower leaves have winged petioles while the upper ones are sessile.

The inflorescence bears flowers on stalks 1 to 3 cm (0.4 to 1.2 in) long. The whitish to pale pink flowers are 20 to 27 mm (0.8 to 1.1 in) long with the upper lobed portion colored lavender-blue and with purplish lines extending into the interior. That part of the corolla below the lobes is strongly inflated. The exterior of the corolla is glandular pubescent, while the interior is only slightly so. There is a densely bearded sterile stamen which projects from the flower, in addition to the shorter fertile stamens. The calyx has ovate-lanceolate sepals.

The subspecies can be distinguished from the typical form of the species by the external glandular pubescence on the corolla and the ovate-lanceolate sepals, while the species has a corolla which is externally smooth but densely glandular within. The calyx lobes in the species are rotund-ovate rather than lance-ovate.

Flowering from April to June.

HABITAT: Sandy or gravelly washes. Associated plants: *Juniperus osteosperma, Atriplex confertifolia, Larrea tridentata, Ambrosia dumosa,* and *Coleogyne ramosissima*. Elevation: 1005-1585 m (3300-5200 ft).

KNOWN DISTRIBUTION: Clark and Nye counties, NV. San Bernardino County, CA.

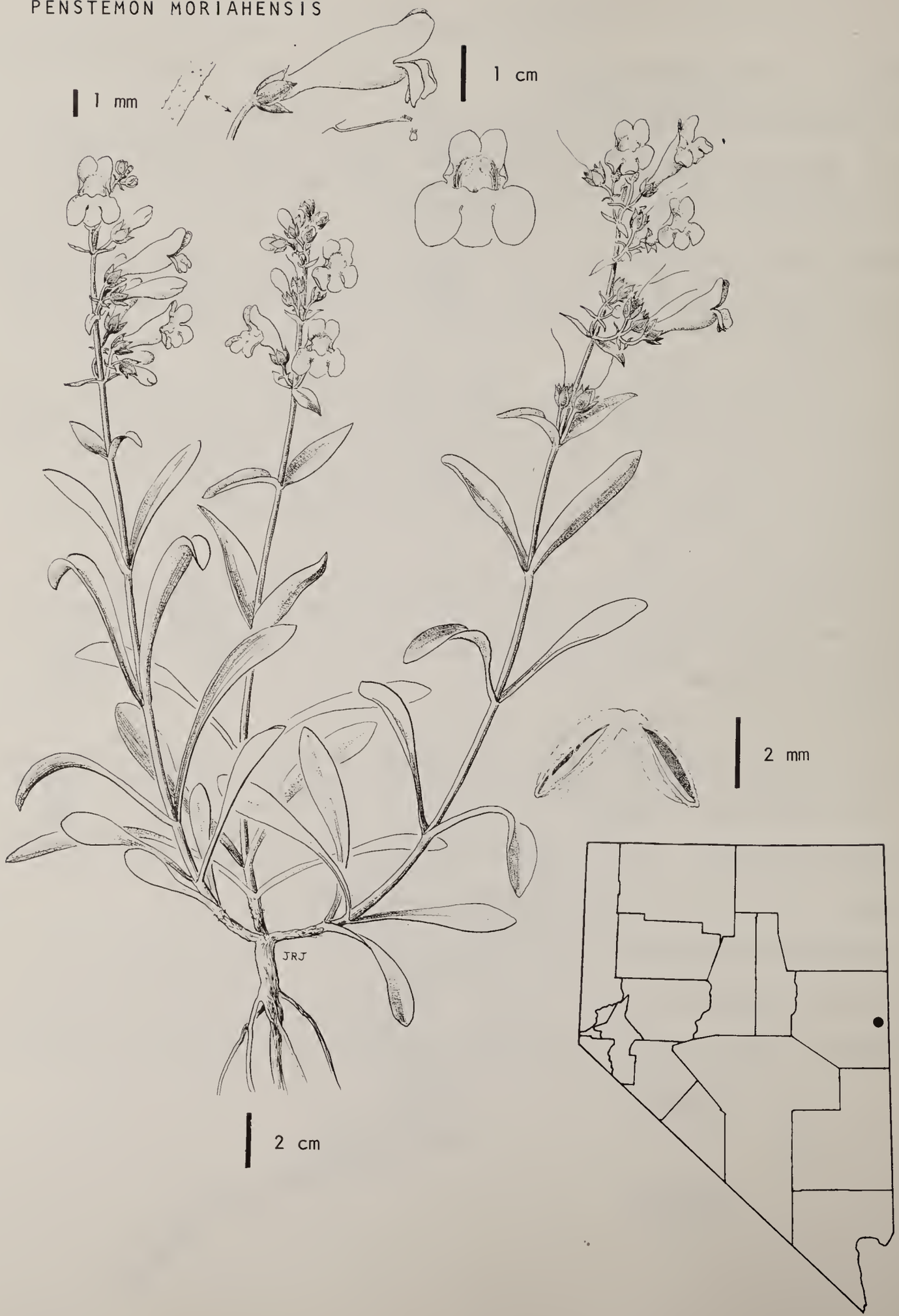
STATUS: Threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and DOE (Nevada Test Site).

EXISTING OR POTENTIAL THREATS: Proposed MX system.

REMARKS: Further search is needed to determine the distribution and abundance of this rare taxon and the threats to it.

PENSTEMON MORIAHENSIS



PENSTEMON MORIAHENSIS N. Holmgren
Mt. Moriah Penstemon

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Penstemon moriahensis* N. Holmgren, Brittonia, 30:422. 1978. Type: N.H. and P.K. Holmgren, N. Snake Range, White Pine County, NV, 2800 m, 17 July 1977. The type collection was made near Mt. Moriah.

DESCRIPTION: A perennial with a few to several erect to ascending stems arising from a root crown. The stems become 3.5 to 5 dm (14 to 20 in) tall. The stem leaves are 4 to 8 cm (1.6 to 3.2 in) long, smooth, entire, with the lower ones oblanceolate and petioled while the upper ones are lanceolate and sessile.

The inflorescence consists of 4 to 8 clusters of blue flowers on glandular, fine pubescent individual flower stalks. The 7 to 10 mm long similarly pubescent, lanceolate calyx segments enclose the base of the 27 to 33 mm (1.1 to 1.3 in) long corolla, which is hairless, inside and out. The sterile stamen is bearded with fine, white hairs. The narrowly elliptic anther sacs are 2.0 to 2.8 mm long, pubescent with long, tangled hairs.

The critical features which distinguish this species from any others to be found in the area are, most importantly, the long, white wavy hairs on the anthers and the glandular-pubescent inflorescence. Additionally, the smooth corolla and oblanceolate leaves can be used for confirmation.

Flowering from June to July.

HABITAT: Associated with sagebrush in mountain mahogany woodlands and open ponderosa pine woods. Elevation: 2515-2815 m.(8250-9240 ft).

KNOWN DISTRIBUTION: White Pine County, Nevada.

STATUS: Threatened (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Mining activity. Proposed MX system (indirectly.)

REMARKS: This species should be searched for in similar habitats so that a better assessment of the threats can be made. At present, it is only known from a very limited area.

PENSTEMON PAHUTENSIS

PENSTEMON PAHUTENSIS N. Holmgren
Pahute Penstemon

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Penstemon pahutensis* N. Holmgren, Aliso, 7:351. 1971. Type: Reveal, Nevada Test Site, Nye County, NV, 7100 ft, 10 June 1968. The type specimen was collected on the Pahute Mesa Road.

DESCRIPTION: A perennial with several stems arising from a root crown and ranging in height from 15 to 74 cm (6 to 30 in). The basal leaves are oblanceolate or elliptic 5 to 10 cm (2 to 4 in) long and petiolate. The stem leaves are usually sessile and about the same length, but are narrow-oblanceolate to narrow-lanceolate, and reduced toward the upper part of the stem. Additionally, the leaves are thick textured and smooth.

The inflorescence bears 6 to 13 clusters of pinkish-lavender to bluish-lavender flowers with smooth, broadly ovate sepals 3 to 5 mm long. The corolla is 21 to 26 mm (0.8 to 1 in) long, with the narrow tube at the base 5 to 8 mm long. The upper part of the corolla on the inside is bearded white or yellow. The sterile stamen is densely bearded with golden yellow hairs.

While this species resembles *Penstemon speciosus* Dougl. and related forms possibly found in the same area it may be easily separated by the short sepals, and the beard on the upper inner portion of the corolla.

Flowering from June to mid-July.

HABITAT: Open areas of very loose soil; very rocky areas among boulders or growing from rock crevices. Associated plants: pinyon-juniper woodland or *Artemisia* shrubland. Elevation: 1770-2285 m (5800-7500 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

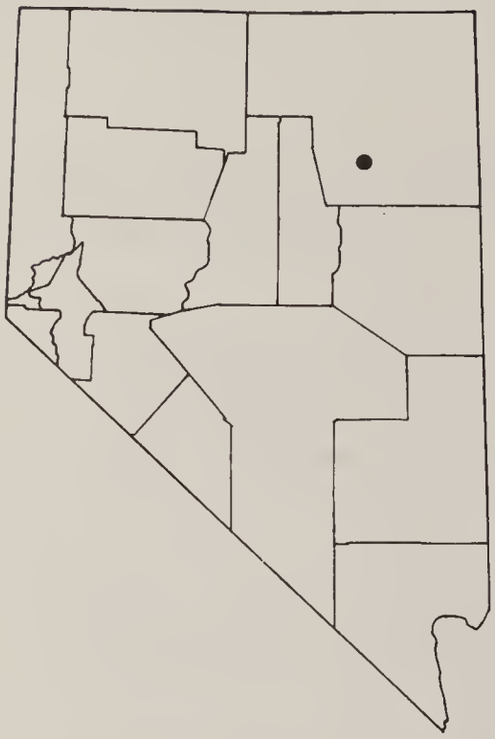
STATUS: Endangered (1975 and 1976 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM, DOD (Nellis AFB Bombing and Gunnery Range), and DOE (Nevada Test Site).

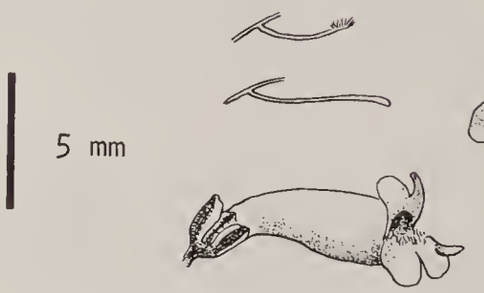
EXISTING OR POTENTIAL THREATS: None known.

REMARKS: *Penstemon pahutensis* has a limited distribution. It has been found in disturbed areas. The populations should be monitored in order to determine if disturbance is a threat and if there are any other threats.

PENSTEMON PROCERUS ssp. MODESTUS



1 cm



5 mm

2 mm

1 cm

JRJ

PENSTEMON PROCERUS Dougl. ex Grah. ssp. MODESTUS (Greene) Keck
Ruby Mountains Penstemon

FAMILY: Scrophulariaceae -- Figwort Family.

CITATION AND HISTORY: *Penstemon procerus* ssp. *modestus* (Greene) Keck, Brittonia, 8:249. 1957. Synonym: *Penstemon modestus* Greene, Leaflets of Botanical Observation and Criticism, 1:165. 1906. Type: Greene, Ruby Mountains, Elko County, Nevada, 20 July 1896. The specific name, *modestus*, possibly refers to the smallness of the parts of these plants.

DESCRIPTION: A perennial with a woody branching base producing stems 20 to 25 cm (8 to 10 in) high. The obovate to elliptic leaves in the basal rosette are about 2.5 cm (1 in) long and firm to somewhat leathery in texture. Both the basal leaves and the smaller spatulate-oblong stem leaves lack pubescence.

The inflorescence consists of 2 to 5 apparent whorls of small blue flowers. The calyx consists of small, obovate, and truncate sepals which are somewhat toothed at the tip. The corolla is about 8 mm long with slender base. The lower lip is bearded as is the sterile stamen at the tip.

From similar appearing penstemons with small blue flowers this can be separated by the perfectly smooth nature of its stems and leaves, spatulate stem leaves, and round anther sacs.

Flowering in July and August.

HABITAT: In meadows and among granitic rocks. Associated plants: grasses, *Geum rossii, Antennaria rosea, Arenaria aculeata,* and *Linanthus nuttallii*. Elevation: 2620-3050 m (8600-10,000 ft).

KNOWN DISTRIBUTION: Elko County, Nevada.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

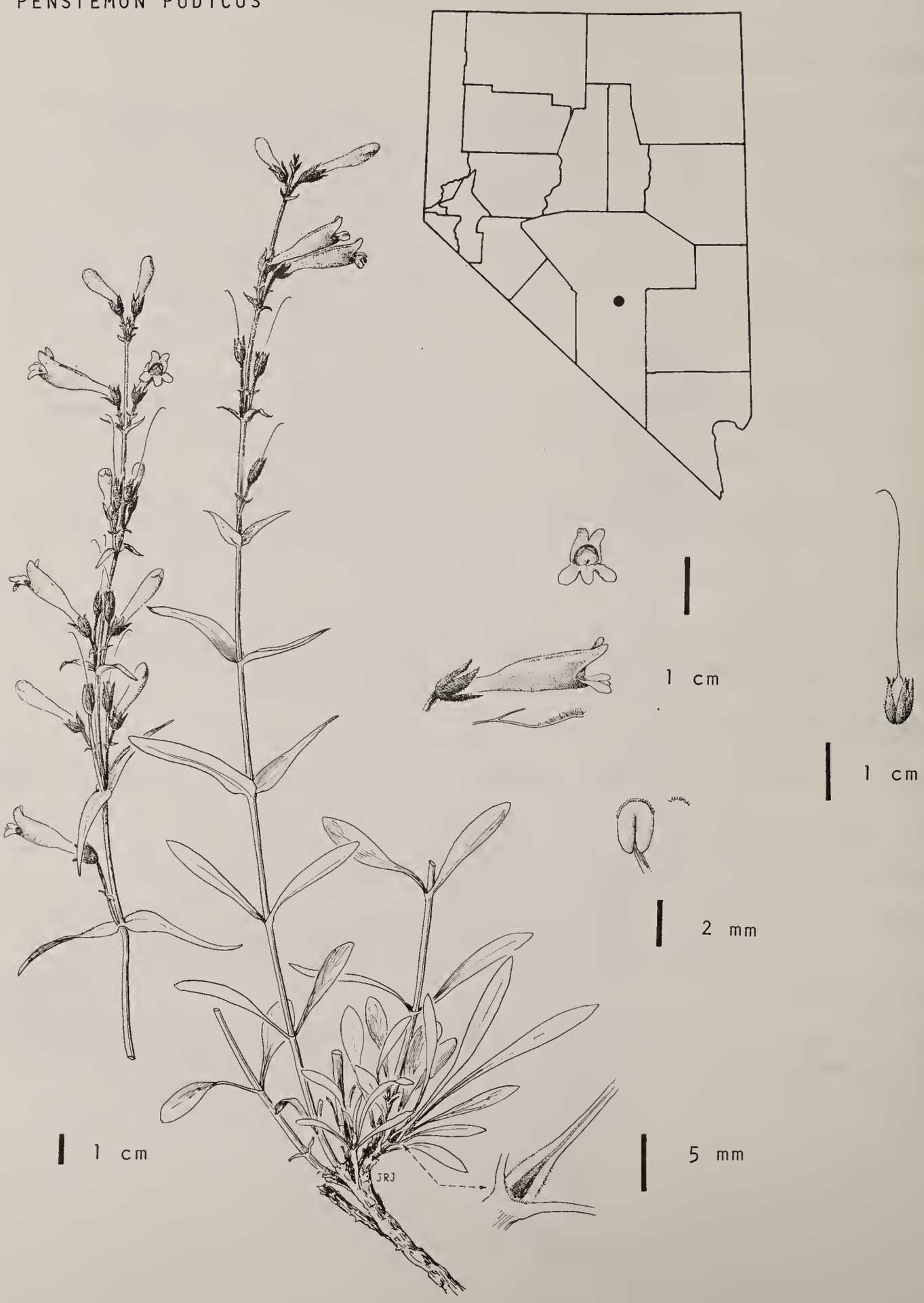
LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Grazing and trampling by sheep.

REMARKS: This plant is only known from a few locations and it is not abundant at any of them. Theoretically, sheep are not supposed to be grazing in the areas where these plants grow, but this rule is not always being enforced.

NOTE: It has just been brought to our attention that the name of this plant now is *Penstemon procerus* var. *modestus* (Greene) N. Holmgren, Brittonia, 31:104. 1979.

PENSTEMON PUDICUS



PENSTEMON PUDICUS Reveal & Beatley
Bashful Penstemon

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Penstemon pudicus* Reveal and Beatley, Bulletin of the Torrey Botanical Club, 98:332. 1971. Type: Beatley, Kawich Range, Nye County, Nevada, 2320-2750 m, 5 July 1971. The specific name, *pudicus*, meaning modest or bashful, refers to its remote occurrence.

DESCRIPTION: A perennial with a woody base from which arise several stems which may be somewhat glandular. The basal leaves are oblanceolate to spatulate and up to 5 cm (2 in) long on slender petioles 1 to 3 cm (0.4 to 1.2 in) long. The stem leaves are linear-oblanceolate and up to 5 cm (2 in) long.

The open inflorescence bears 3 to 6 clusters of blue to violet flowers. The inflorescence, individual flower stalks, and the exterior of the flowers bear small glands. The individual flower stalks are usually shorter than 2 cm (0.8 in) and support 6 to 8 mm long sepals. The corolla is 25 to 35 mm (1 to 1.4 in) long and hairless on the inside. The sterile stamen is bearded with long golden yellow hairs. The anthers are hairless.

The dark brown capsules are 8 to 11 mm long and produce yellowish black or grayish seeds about 1.5 mm long.

The key characteristics of bearded staminode, large flowers, and 2 to 4.5 dm (8 to 18 in) height, allow easy separation from *Penstemon kingii* S. Wats., a smaller plant found in the same general area.

Flowering in June and July.

HABITAT: Steep mountain slopes, woodland borders, or along washes, in partial shade. Associated plants: *Pinus monophylla*, *Juniperus osteosperma*, *Cercocarpus ledifolius*, and *Artemisia tridentata*. Elevation: 2320-2805 m (7600-9200 ft).

KNOWN DISTRIBUTION: Nye County, Nevada.

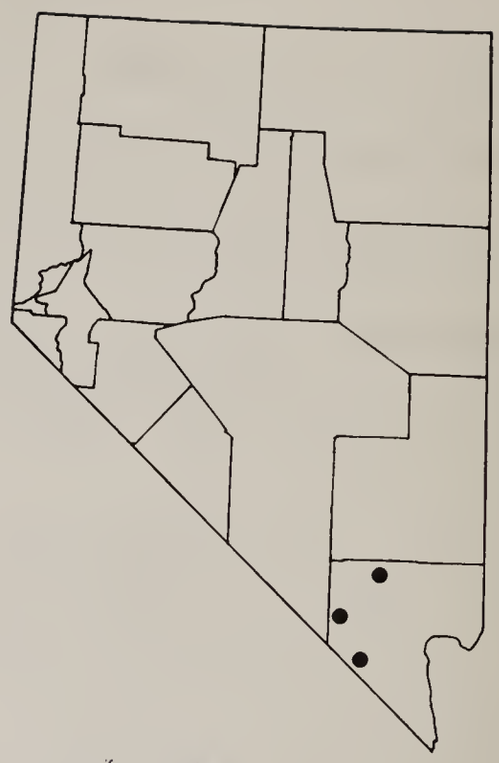
STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979).

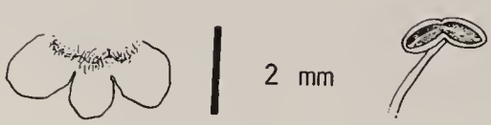
LAND OWNERSHIP/MANAGEMENT: BLM and possibly private.

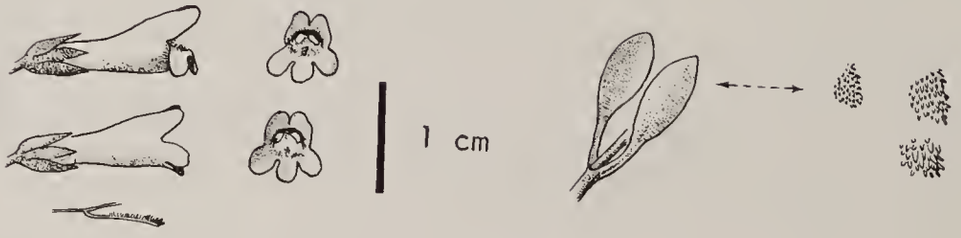
EXISTING OR POTENTIAL THREATS: Grazing by wildhorses. Mining activity. Proposed MX system.

REMARKS: An effort should be made to determine the full range and abundance of *Penstemon pudicus* which is only known from a limited remote area.

PENSTEMON THOMPSONIAE ssp. JAEGERI







PENSTEMON THOMPSONIAE (Gray) Rydb. ssp. JAEGERI Keck
Jaeger Penstemon

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Penstemon thompsoniae* ssp. *jaegeri* Keck, Bulletin of the Torrey Botanical Club, 64:362. 1937. Type: Jaeger, Charleston (Spring) Mountains, Clark County, Nevada, 2750 m, 27 June 1926. The specific name, *jaegeri*, and the common name honor the collector of the type specimen, Edmund C. Jaeger.

DESCRIPTION: A tufted or matted perennial somewhat woody at the base, with elliptic, obovate leaves abruptly narrowed to the petiole. The leaves are entire and 0.5 to 1.2 cm long and have a whitish aspect due to the closely appressed white hairs covering them.

The leafy inflorescence is glandular and bears blue-violet flowers with corollas 12 to 14 mm long. The sterile stamen is bearded with golden hairs for most of its length. The anther sacs on the fertile stamens are oblong-ovate.

The small, ash-colored leaves, blue-violet flowers and glandular inflorescence readily separate this *Penstemon* from any other similar species in the same area. From the very similar *P. caespitosus* Nutt. which is not known from the same area it may be separated by the wider leaves and deeper blue-purple flowers of the former.

Flowering in June and July:

HABITAT: Gravelly limestone banks or hillsides. Associated plants: *Pinus ponderosa* var. *scopulorum*, *P. monophylla*, *Cercocarpus ledifolius*, *Castilleja linariifolia*, *Townsendia jonesii* var. *tumulosa*, *Penstemon keckii*, and *Arenaria kingii* ssp. *rosea*. Elevation: 1920-2835 m (6300-9300 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: USFS, USFWS, possibly BLM, and possibly private.

EXISTING OR POTENTIAL THREATS: Recreational use of the area in the Spring Mountains where these plants grow. Proposed MX system (indirectly).

REMARKS: There are no threats to this *Penstemon* in the Desert National Wildlife Range as long as present management policies are continued.

PENSTEMON THURBERI

PENSTEMON THURBERI Torr. var. ANESTIUS Reveal & Beatley
Buried Hills Penstemon

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Penstemon thurberi* var. *anestius* Reveal & Beatley, Great Basin Naturalist, 34:230. 1974. Type: Beatley and Ackerman, Clark County, Nevada, 3800 ft, 20 June 1973. The common name is taken from the type location.

DESCRIPTION: A somewhat shrubby plant 3 to 5 dm (12 to 20 in) tall with numerous, erect, usually unbranched smooth stems. The green, narrowly linear leaves are curled upward and somewhat rough along the margins and are 1 to 3 cm (0.4 to 1.2 in) long.

The inflorescence has flower stalks bearing usually just one flower. The bluish or lavender-rose flowers have a 2 to 3 mm calyx with broadly ovate lobes. The flowers are 8 to 9 mm in length. The sterile stamen is not hairy and the four fertile stamens have ovate anther sacs.

The mature capsules are relatively small, 4 to 5 mm long. The typical form, var. *thurberi*, has larger flowers (12 to 15 mm) and larger capsules (6 to 9 mm). Recent evidence (N. Holmgren, personal communication) indicates that var. *anestius* may have been described from immature var. *thurberi* and consequently is not a valid entity. Additional field work is required to solve this quandry. The linear leaves, hairless character, and flower size serve to distinguish this *Penstemon* from any others likely to be encountered in the same area.

Flowering in June.

HABITAT: Deep, loose, volcanic sands especially in low areas or in saddles between hills. Associated plants: *Larrea tridentata, Ambrosia dumosa, Krameria parvifolia, Yucca brevifolia, Ephedra nevadensis,* and *Oryzopsis hymenoides*. Elevation: 1160-1250 m (3800-4100 ft).

KNOWN DISTRIBUTION: Clark and Lincoln counties, Nevada.

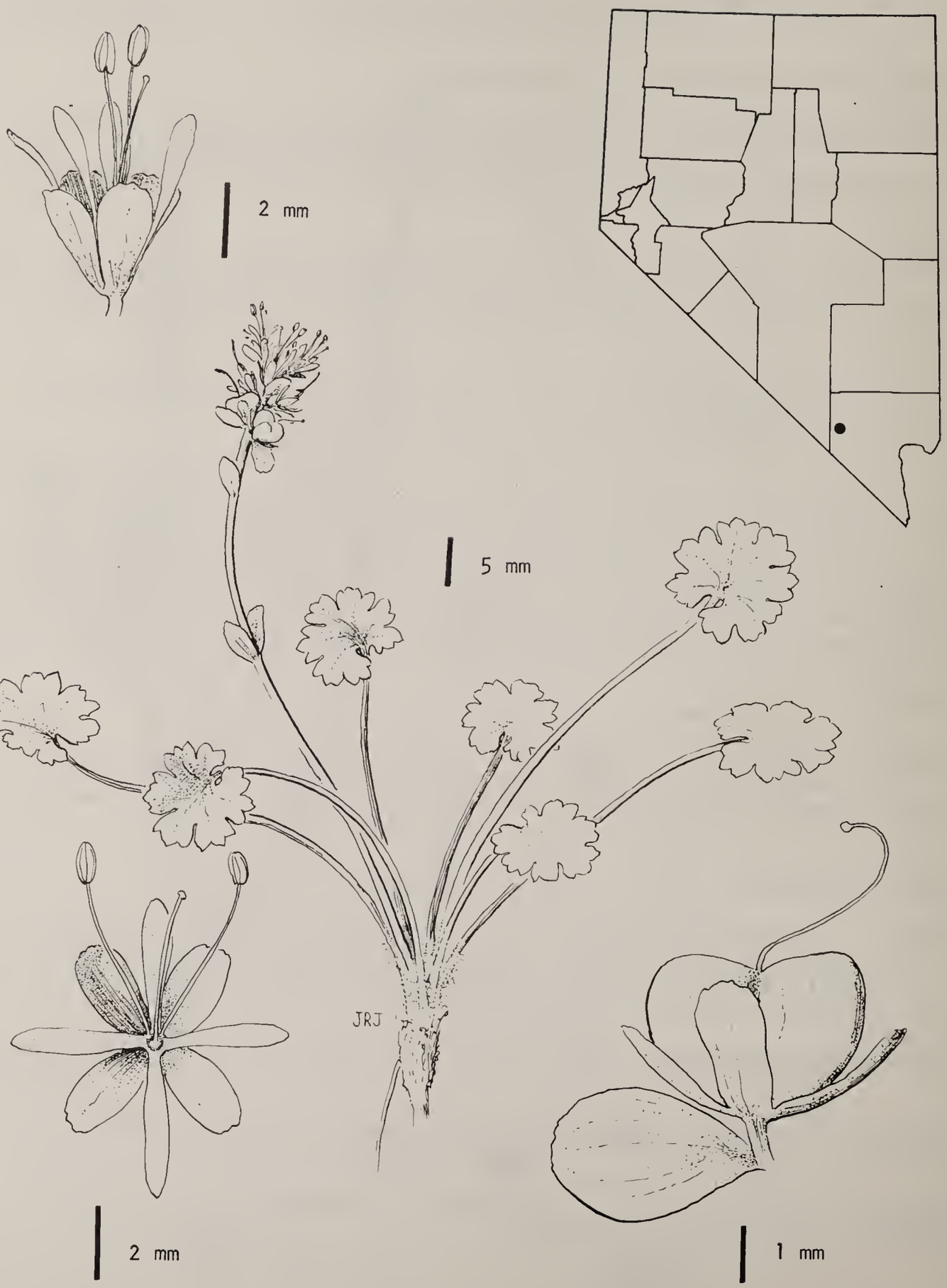
STATUS: Threatened (Reno T/E Workshop, 25 Feb 1978); endangered (Reno T/E Workshop, 2 Nov 1979). Listed as threatened with extinction, Nevada Division of Forestry (14 Feb 1979); protected by NRS 527.270; collection permit required. Deleted (Mozingo and Williams).

LAND OWNERSHIP/MANAGEMENT: DOD (Nellis AFB Bombing and Gunnery Range) and USFWS.

EXISTING OR POTENTIAL THREATS: Highly susceptible to any disturbance of its habitat. Proposed MX system.

REMARKS: This taxon has been recommended to be deleted because of its dubious taxonomic validity.

SYNTHYRIS RANUNCULINA



SYNTHYRIS RANUNCULINA Pennell
Charleston Kittentails

FAMILY: Scrophulariaceae -- Figwort Family

CITATION AND HISTORY: *Synthyris ranunculina* Pennell, Proceedings of the Academy of Natural Sciences of Philadelphia, 85:92. 1933. Type: Heller, Charleston (Spring) Mountains, Clark County, NV, 9300 ft, 30 July 1913. The specific name, *ranunculina*, means resembling a *ranunculus* which is the Latin name for a little frog, referring to the habit of this species of growing in wet places where frogs may be found.

DESCRIPTION: A perennial herb with a basal tuft of reniform, smooth, petioled leaves. The reniform leaf blade is 1 to 2 cm wide and 5 to 7 lobed, with the lobes each having 3 triangular teeth. The long petioles may reach 4 cm (1.6 in).

The short, smooth flowering stems eventually become 6 to 8 cm (2.4 to 3.2 in) long as the fruit develops and frequently become curved. The blue or violet flowers have a corolla fused only at the base and divided into four elongated, linear lobes about 4 mm long. The oblong-lanceolate sepals become about 2.5 mm long in fruit. The capsule is wide and somewhat flattened.

The small, four-parted blue or violet flowers lacking a spur and the basal cluster of reniform leaves make this an easy plant to recognize. No other species of *Synthyris* occurs within the area or adjacent California.

Flowering from late June into August.

HABITAT: Permanently damp banks, moist meadows. Associated plants: grasses, near *Pinus longaeva* and *P. flexilis*, and *Cystopteris fragilis*. Elevation: 2620-3350 m (8600-11,000 ft).

KNOWN DISTRIBUTION: Clark County, Nevada.

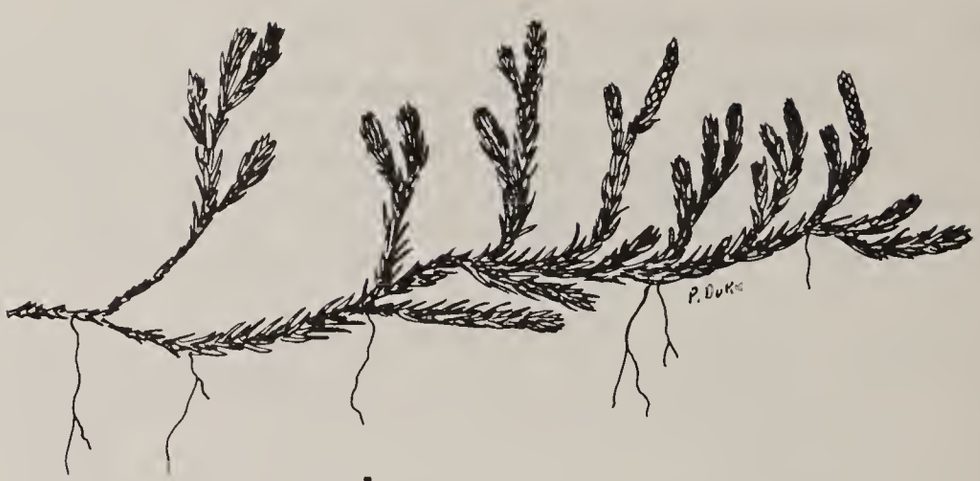
STATUS: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: USFS.

EXISTING OR POTENTIAL THREATS: Recreational use of the area in the Spring Mountains where these plants grow. Removal of plants for horticultural purposes. Proposed MX system (indirectly).

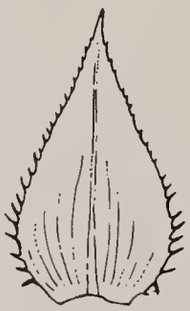
REMARKS: *Synthyris ranunculina* is a very rare species which appears to require a unique habitat, care must be taken to preserve that habitat. The expanding population in southern Nevada will increase the impact on the plants in the Spring Mountains.

SELAGINELLA UTAHENSIS

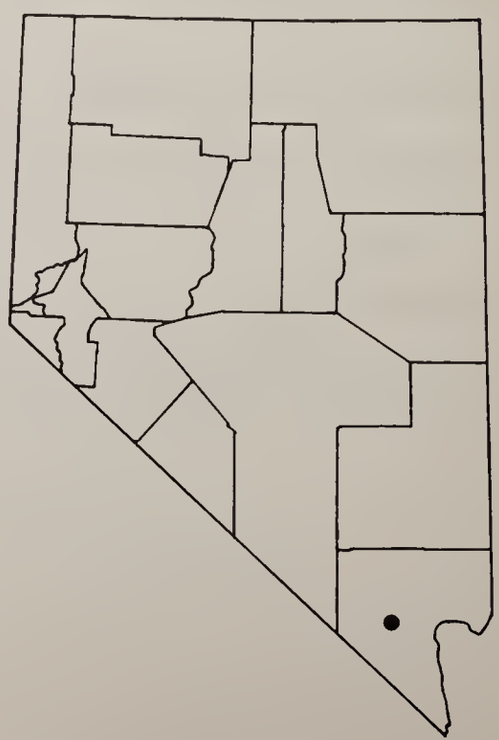


5 mm

0.5 mm



0.1 mm



SELAGINELLA UTAHENSIS Flowers
Utah Spikemoss

FAMILY: Selaginellaceae -- Selaginella Family

CITATION AND HISTORY: *Selaginella utahensis* Flowers, American Fern Journal, 35:83. 1949. Type: Cottam, Washington County, UT, 6500 ft, 5 April 1931. This taxon was named for the state of Utah.

DESCRIPTION: A much branched, loosely to densely clumped perennial, pale green with sometimes a bluish cast, and with creeping main stems which may reach a length of 6 cm (2.4 in). The leaves are oblong to linear-lanceolate, and 2 to 3.2 mm long by 0.4 to 0.5 mm wide. The tips are tapered either gradually or somewhat abruptly, while the tips themselves are either sharply pointed or sometimes obtuse. A short, transparent hair point no longer than 0.14 mm may occur on some of the upper leaves. There are 6 to 12 marginal hairs on the leaves.

The spore-bearing spikes are about 1 cm long and bear triangular-ovate to ovate-lanceolate leaves which are 2 to 3 mm long.

This species closely resembles the common *S. watsonii* Underw. but can be separated most easily by means of leaf characteristics. In *S. utahensis* the leaves, in general, taper more gradually, are longer and narrower, and are less strongly convex on the back near the tip. The most apparent difference involves the terminal hair points which on *S. watsonii* leaves reach a length of 0.2 to 0.35 mm.

HABITAT: Sandstone cliffs. Associated plants: *Selaginella watsonii, Garrya flavescens, Arctostaphylos pungens, Rhus trilobata,* and *Quercus turbinella.* Elevation: 1220-1980 m (4000-6500 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. Washington County, Utah.

STATUS: Threatened (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

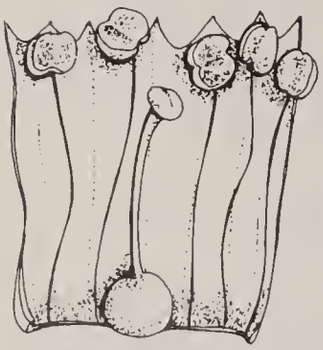
LAND OWNERSHIP/MANAGEMENT: BLM and the State of Nevada.

EXISTING OR POTENTIAL THREATS: None known.

REMARKS: Although *Selaginella utahensis* has been searched for recently, it still is only known in Nevada from a single collection made 50 years ago. The cliffs are so steep where it was once found, that it is possible that it is still growing there.

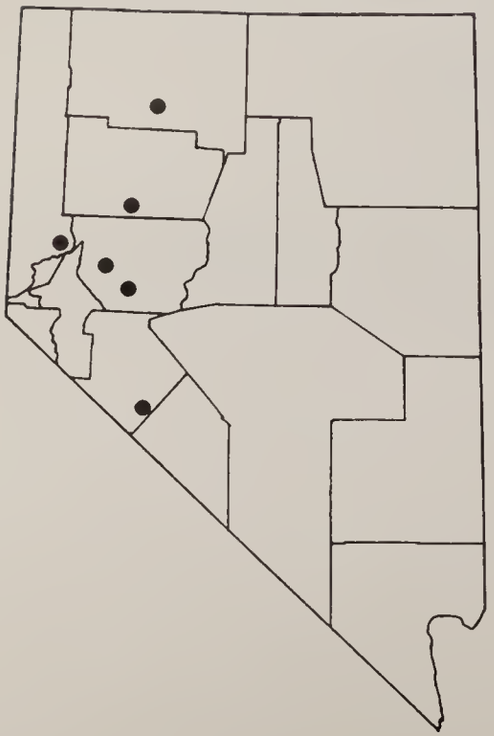
ORYCTES NEVADENSIS

1 mm



1 mm

1 cm



ORYCTES NEVADENSIS S. Wats.
Nevada Oryctes

FAMILY: Solanaceae -- Nightshade Family

CITATION AND HISTORY: *Oryctes nevadensis* S. Watson, "Botany," p. 274. *In:* C. King, Report of the geological explorations of the Fortieth Parallel. Vol. 5. 1871. Type: Watson, Big Bend of the Truckee, Nevada, May. The specific name and the common name both refer to the state of Nevada.

DESCRIPTION: A small, alternate leaved annual occasionally to 20 cm (8 in) tall, but usually much shorter. The 1 to 5 cm long leaves are ovate to lanceolate and are minutely scaly and sticky pubescent as are also the stems.

Flowers are borne in upper leaf axils in clusters of 3 or 4 on short pedicels. The 5-parted calyx is 2 to 3 mm long during flowering, but subsequently enlarges and keeps pace with the developing capsule. The corolla is about 6 mm long, is blue or purplish, and has 5 short triangular lobes. Five stamens are inserted on the corolla near the base, and as with the style, the stamens nearly equal the length of the corolla.

The 6 to 7 mm capsule is two valved and splits open at maturity to release 10 to 20 slightly rough seeds which are winged. The body of the seed is about 2 mm wide while the wing is about 0.5 mm wide.

Flowering from late April to June.

HABITAT: Sandy slopes, foothills, dunes. Associated plants: *Atriplex confertifolia, A. canescens, Oryzopsis hymenoides, Tetradymia tetrameres, Grayia spinosa, Sarcobatus vermiculatus, Psorothamnus polydenius,* and *Chrysothamnus nauseosus.* Elevation: 1190-1350 m (3900-4400 ft).

KNOWN DISTRIBUTION: Churchill, Humboldt, Mineral, Pershing, and Washoe counties, Nevada. Inyo County, California.

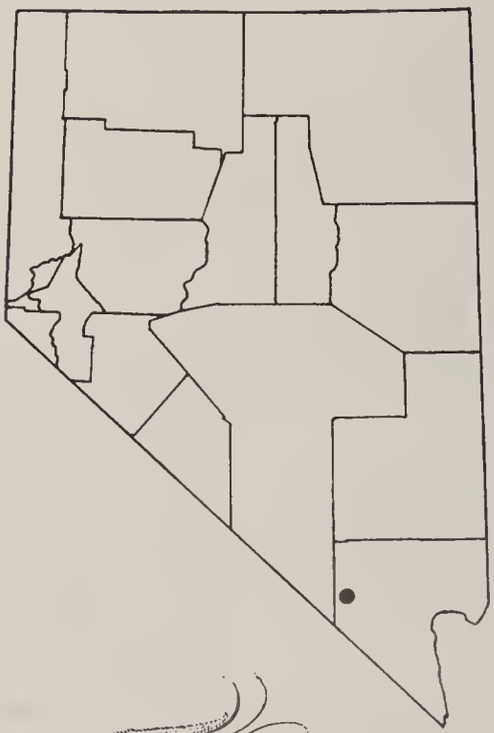
STATUS: Threatened (Reno T/E Workshop, 9 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979); threatened (Mozingo and Williams).

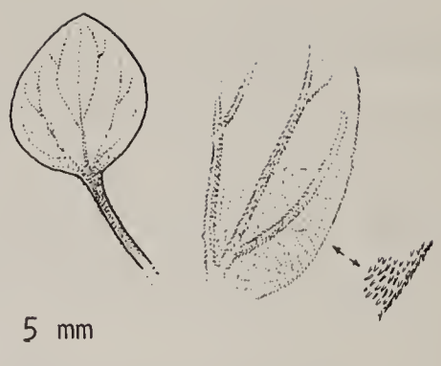
LAND OWNERSHIP/MANAGEMENT: BLM, Indian Reservation, US Water and Power Resources Service, and private.

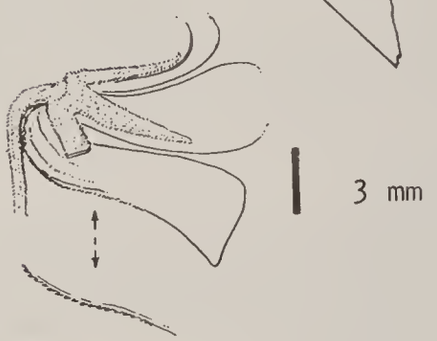
EXISTING OR POTENTIAL THREATS: Off-road vehicles. Early summer grazing. Proposed MX system.

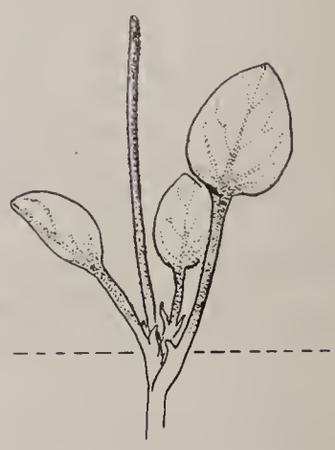
REMARKS: Although *Oryctes nevadensis* has a wide distribution, it is not abundant at any one site. During dry years it may be present in limited numbers, but it is never easy to find. It should be protected because of its rarity and because it is a monotypic genus in a family of plants of economic importance.

VIOLA PURPUREA var. CHARLESTONENSIS









VIOLA PURPUREA Kell. var. CHARLESTONENSIS (Baker & Clausen) Welsh & Reveal
LIMESTONE VIOLET

FAMILY: Violaceae -- Violet Family

CITATION AND HISTORY: *Viola purpurea* var. *charlestonensis* (Baker & Clausen) Welsh & Reveal, Great Basin Naturalist, 35:371. 1975. Synonym: *Viola charlestonensis* Baker & Clausen ex Clokey, Madroño, 8:58. 1945. Type: Clokey, Charleston (Spring) Mountains, Clark County, Nevada, 2670 m, 23 May 1937. This violet was named for Mt. Charleston, where it was first collected growing on limestone.

DESCRIPTION: An herbaceous perennial with one to eight partially subterranean stems. The thick, ashy leaves have white veins and are purplish beneath. Both leaf surfaces, petioles, and stems are clothed with short, appressed hairs. The leaves vary from broadly ovate to somewhat narrower with blades from 8 to 25 mm long. The stem leaves tend to be somewhat narrower with a sharper point and more triangular shaped base than the basal leaves.

The sepals of the flowers are linear-lanceolate, about 4 mm long and pubescent with short, white hairs. The corolla is 12 to 17 mm wide and yellow on the front of the petals. On the back, the upper petals especially are evidently darkened. The lower petal produces a short spur covered with hair-like processes.

The ovary and base of the style is densely covered with minute spur-like processes. The capsule becomes relatively large, about as wide as long, and densely pubescent with fine hairs.

This species is easily separated from any other yellow violet found in the area by its entire leaves, dense white pubescence, and pubescent petal spur.

Flowering in May and June.

HABITAT: Limestone hills, slopes, and dry washes. Associated plants: *Pinus monophylla*, *P. ponderosa* var. *scopulorum*, *Populus tremuloides*, *Juniperus osteosperma*, *Penstemon bridgesii*, and *P. eatonii*. Elevation: 2000-2900 m (6560-9510 ft).

KNOWN DISTRIBUTION: Clark County, Nevada. Washington County, Utah.

STATUS: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 2 November 1979).

LAND OWNERSHIP/MANAGEMENT: State of Nevada, BLM, USFS, and possibly private.

EXISTING OR POTENTIAL THREATS: Recreational use of the area where these plants grow. Proposed MX system (indirectly).

REMARKS: The expanding population in southern Nevada will increase the impact on plants in the Spring Mountains. This taxon is also regarded as threatened in Utah.

ASTRAGALUS YODER-WILLIAMSII Barneby
Osgood Mountains Milk-vetch

FAMILY: Fabaceae (Leguminosae) -- Pea Family

CITATION AND HISTORY: *Astragalus yoder-williamsii* Barneby, Brittonia, 32:30. (Illustrated.) Type: Yoder-Williams, Osgood Mountains, Humboldt County, NV, 2170 m, 11 July 1979.

HABITAT: Decomposed granite, gravel flats. Associated plants: *Artemisia arbuscula* and *Chrysothamnus nauseosus*. Elevation: 2170 m (7120 ft).

KNOWN DISTRIBUTION: Humboldt County, Nevada. Owyhee County, Idaho.

STATUS: Endangered (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: BLM and private.

EXISTING OR POTENTIAL THREATS: Mining activities. Proposed MX system (indirectly).

REMARKS: The habitat of this rare plant should be protected.

ADDENDUM: On 13 Aug 1980, *Astragalus yoder-williamsii* was declared an endangered species under the Federal regulations governing emergency determination of endangered status and designation of critical habitats. This emergency determination is effective until 15 April 1981. (*Federal Register* 45:53968-53970)

ERIOGONUM OVALIFOLIUM undescribed variety
Steamboat Springs Buckwheat

FAMILY: Polygonaceae -- Buckwheat Family.

CITATION AND HISTORY: This variety of *Eriogonum ovalifolium* has been known for some time, but it is undescribed.

HABITAT: Light-colored soils, tufa, in the vicinity of the hot springs. Associated plants: *Sarcobatus vermiculatus, Atriplex confertifolia, Chrysothamnus nauseosus*. Elevation: 1465 m (4800 ft).

KNOWN DISTRIBUTION: Washoe County, Nevada.

STATUS: Endangered (Reno T/E Workshop, 2 Nov 1979).

LAND OWNERSHIP/MANAGEMENT: Private.

EXISTING OR POTENTIAL THREATS: Geothermal drilling.

REMARKS: The habitat of this buckwheat is extremely limited and it should be protected.

APPENDIX B -- Plants on the watch list not illustrated.

AGAVE UTAHENSIS var. NEVADENSIS Engelm. ex Greenm. --Agavaceae -- Agave Family

Status: Threatened (1975 *FR*): watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Shadscale and pinyon-juniper.

Known distribution: Possibly in Clark County, however, there is some doubt that this plant grows in Nevada. California.

Remarks: This variety is similar in appearance to *Agave utahensis* var. *eborispina* but the spines on the leaves are shorter.

ARABIS SHOCKLEYI Munz -- Brassicaceae -- Mustard Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Shadscale, low sagebrush, and pinyon-juniper.

Known distribution: Esmeralda and Nye counties, NV. California and Utah.

Remarks: Although this is widely distributed, it has been rarely collected.

ASTRAGALUS CIMAE Jones var. CIMAE -- Fabaceae -- Pea Family

Status: Watch list (Mozingo and Williams).

Associated with: Shadscale.

Known distribution: Nye County, Nevada. California.

Remarks: This taxon has been rarely collected in Nevada. It is illustrated in Abrams (1944) 2:593.

CAMISSONIA MEGALANTHA (Munz) Raven -- Onagraceae -- Evening Primrose Family

Status: Endangered (1975 and 1976 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Shadscale.

Known distribution: Nye County, Nevada. Utah.

Remarks: This taxon seems to do well in disturbed soil.

CAMISSONIA NEVADENSIS (Kell.) Raven -- Onagraceae -- Evening Primrose Family

Status: Endangered (1975 and 1976 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush.

Known distribution: Carson City, Churchill, Lyon, Mineral, Pershing, Storey, and Washoe counties, Nevada.

Remarks: The occurrence and abundance of this annual may vary from year to year. It is illustrated in the Newsletter of the Northern Nevada Native Plant Society, May 1978; Muhlenbergia, 5:51, 1910; and Abrams (1951) 3:203.

APPENDIX B -- Watch List

CIRSIUM CLOKEYI Blake -- Asteraceae -- Sunflower Family

Status: Endangered (1975 and 1976 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Mountain brush, Great Basin coniferous and subalpine forests.

Known distribution: Clark County, Nevada.

Remarks: This thistle is widely distributed in the Spring Mountains and seems to thrive in disturbed areas.

CYMOPTERUS CORRUGATUS Jones -- Apiaceae -- Carrot Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, greasewood-saltbush.

Known distribution: Churchill, Humboldt, Lyon, Mineral, Nye, Pershing, and Washoe counties, Nevada. Oregon.

Remarks: This spring parsley is widely distributed in areas where there are few threats. Illustrated in Abrams (1951) 3:280.

CYMOPTERUS GOODRICHII Welsh and Neese -- Apiaceae -- Carrot Family

Status: Threatened (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

Associated with: Alpine fell fields.

Known distribution: Lander County, Nevada.

Remarks: This new species was described and illustrated in Madroño, 27(2): 97. 1980. Although this has only been found in a limited area in the Toiyabe Mountains, there are no known threats to this plant.

CYMOPTERUS RIPLEYI var. SANICULOIDES Barneby -- Apiaceae -- Carrot Family

Status: Watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Shadscale.

Known distribution: Nye County, Nevada.

Remarks: There is some question as to whether this variety is taxonomically distinct from var. *ripleyi* which is more widespread.

DRABA ARIDA C.L. Hitchc. -- Brassicaceae -- Mustard Family

Status: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Alpine fell-fields.

Known distribution: Lander and Nye counties, Nevada.

Remarks: There are no known threats to this taxon.

APPENDIX B -- Watch List

DRABA DOUGLASII Gray -- Brassicaceae -- Mustard Family

Status: Endangered (1975 and 1976 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush.

Known distribution: There are records of *Draba douglasii* var. *douglasii* from Humboldt and Washoe counties, Nevada, as well as from Oregon and Washington. Also there are records of *D. douglasii* var. *crockeri* from Carson City, Douglas, Humboldt, and Washoe counties, Nevada, as well as from California. There are many other collections of *D. douglasii* (no variety indicated) from Elko, Storey, Lander, and White Pine counties in Nevada.

Remarks: No real threats seem to be apparent to any of these plants. Illustrated in Abrams (1944) 2:300.

DRABA SPHAEROIDES Pays. var. CUSICKII (Robins.) C.L. Hitchc. -- Brassicaceae -- Mustard Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov. 1979).

Associated with: Rocky outcrops, pinyon-juniper, Great Basin coniferous forest.

Known distribution: White Pine and Nye counties, Nevada. Oregon and Utah.

Remarks: This plant grows in inaccessible areas in Nevada.

EPHEDRA FUNEREA Cov. & Mort. -- Ephedraceae -- Ephedra Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Creosote bush, shadscale.

Known distribution: Nye and Clark counties, Nevada. California.

Remarks: This is widely distributed. Illustrated in Ferris (1974) p. 128.

ERIOGONUM CONCINNUM Reveal -- Polygonaceae -- Buckwheat Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, shadscale, pinyon-juniper.

Known distribution: Nye County, Nevada.

Remarks: Suitable habitats for this plant are common within its range. It is an annual, and is a rapid colonizer in disturbed areas.

APPENDIX B -- Watch List

ERIOGONUM DESERTORUM (Maguire) Davis var. undescribed -- Polygonaceae -- Buckwheat Family

Status: Threatened, Rogers and Tiehm (1979); watch list (Mozingo and Williams).

Associated with: Greasewood-saltbush.

Known distribution: Humboldt County, Nevada.

Remarks: This variety is only known from a single valley. It is threatened by mining activities. However, this plant should be searched for in other areas. Photograph in Rogers and Tiehm (1979).

ERIGONUM OVALIFOLIUM Nutt. var CAELESTINUM Reveal -- Polygonaceae -- Buckwheat Family

STATUS: Threatend (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Alpine fell fields.

Known distribution: Nye County, Nevada.

Remarks: This buckwheat grows abundantly over a large area along the high elevations in the southern part of the Toiyabe Range.

ERIOGONUM RUBRICAULE Tidestr. -- Polygonaceae -- Buckwheat Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, greasewood-saltbush.

Known distribution: Churchill, Eureka, Humboldt, Lander, Lyon, Mineral, Nye, and Pershing counties, Nevada.

Remarks: In the past, this buckwheat was rarely collected. However, recent collections have extended its range considerably.

FEROCACTUS ACANTHODES Britt. & Rose -- Cactaceae -- Cactus Family

Status: Watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Creosote bush.

Known distribution: Clark County, Nevada. Arizona, California, and Utah.

Remarks: This species appears to be widely distributed, however, known populations should be monitored. Illustrated in Abrams (1951) 3:161.

FIMBRISTYLIS THERMALIS S. Wats. -- Cyperaceae -- Sedge Family

Status: Watch list (Mozingo and Williams).

Associated with: Geothermal, riparian, meadows.

Known distribution: Elko and Nye counties, Nevada. Many other states.

Remarks: This species is put into synonomy under *F. spadicea* (L.) Vahl in Cronquist et al. (1977) 6:88, illustrated. It has been rarely collected in Nevada. Also illustrated in Abrams (1955) 1:268.

APPENDIX B -- Watch List

GERANIUM TOQUIMENSE Holmgren & Holmgren -- Geraniaceae -- Geranium Family

Status: Endangered (1975 and 1976 *FR*); endangered (Reno T/E Workshop, 25 Feb 1979); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Pinyon-juniper, alpine fell fields.

Known distribution: Nye County, Nevada.

Remarks: Recent collections have extended its known range considerably. It is now known from elevations varying from 2180-3300 m. Illustrated in Brittonia, 26:311. 1974.

GILIA NYENSIS Reveal -- Polemoniaceae -- Phlox Family

Status: Threatened (1975 *FR*): watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, shadscale, pinyon-juniper.

Known distribution: Nye County, Nevada.

Remarks: This annual is abundant in some years. Illustrated in the Bulletin of the Torrey Botanical Club, 96:481. 1969.

HAPLOPAPPUS ALPINUS Anderson & Goodrich in ed. -- Asteraceae -- Sunflower Family

Status: Watch list (Mozingo and Williams)

Associated with: Alpine fell fields.

Known distribution: Nye County, Nevada.

Remarks: It is expected that this species will be published in a forthcoming issue of the Great Basin Naturalist along with an illustration.

HAPLOPAPPUS BRICKELLIOIDES Blake (HAZARDIA B.) -- Asteraceae -- Sunflower Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Shadscale, barren rocky slopes.

Known distribution: Clark and Nye counties, California.

Remarks: This long-lived shrub grows in inaccessible crevices in limestone cliffs. Illustrated in Jaeger (1940) p. 261.

HAPLOPAPPUS WATSONII Gray -- Asteraceae -- Sunflower Family

Status: Endangered (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Barren rocky outcrops, pinyon-juniper.

Known distribution: Elko, Lincoln, Mineral, Nye, and White Pine counties, Nevada.

Remarks: None.

APPENDIX B -- Watch List

HELIANTHUS DESERTICOLA Heiser -- Asteraceae -- Sunflower Family

Status: Watch list (Mozingo and Williams).

Associated with: Big sagebrush, shadscale.

Known distribution: Churchill and Clark counties, Nevada. Arizona and Utah.

Remarks: This annual should be searched for, it is to be expected in sandy areas.

HULSEA VESTITA Gray ssp. INYOENSIS (Keck) Wilken -- Asteraceae -- Sunflower Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, pinyon-juniper.

Known distribution: Nye County, Nevada. California.

Remarks: This taxon appears to thrive on disturbed soil.

LEPIDIUM NANUM S. Wats. -- Brassicaceae -- Mustard Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Barren knolls, low sagebrush.

Known distribution: Elko, Eureka, Nye, and White Pine counties, Nevada.

Remarks: It would be easy to overlook this inconspicuous plant. Illustrated in King (1871) plate IV.

LINANTHUS ARENICOLA (Jones) Jeps. & Bailey -- Polemoniaceae -- Phlox Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Creosote bush.

Known distribution: Clark, Esmeralda, and Nye counties, NV. California.

Remarks: This inconspicuous annual is widely distributed. Illustrated in Abrams (1951) 3:425.

LUPINUS HOLMGRENANUS C.P. Smith -- Fabaceae -- Pea Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, pinyon-juniper.

Known distribution: Esmeralda and Nye counties, Nevada. California.

Remarks: None.

APPENDIX B -- Watch List

LUPINUS MONTIGENUS Heller (L. CAUDATUS ssp. MONTIGENUS (Heller) Hess & Dunn) -- Fabaceae -- Pea Family

Status: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Sierran subalpine forest.

Known distribution: Carson City and Washoe counties, Nevada. California.

Remarks: Illustrated in Muhlenbergia, 6:110. 1910.

MACHAERANTHERA GRINDELIOIDES (Nutt.) Shinners var. DEPRESSA (Maguire) Cronq. & Keck-- Asteraceae -- Sunflower Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Shadscale, pinyon-juniper.

Known distribution: Clark, Eureka, Lincoln, and White Pine counties, Nevada. Arizona and Utah.

Remarks: Although this taxon is widely distributed, it is not usually locally abundant.

MERTENSIA TOYABENSIS Macbr. -- Boraginaceae -- Borage Family

Status: Possibly extinct (1975 *FR*); endangered (1976 *FR*); threatened (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, mountain brush, aspen.

Known distribution: Lander County, Nevada.

Remarks: Recent field work has proved this plant to be more abundant than was previously believed.

MIMULUS WASHOENSIS Edwin -- Scrophulariaceae -- Figwort Family

Status: Threatened (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush.

Knwon distribution: Washoe and possibly Storey counties, Nevada.

Remarks: In favorable years, this annual is more widely distributed than was previously believed.

MIRABILIS PUDICA Barneby -- Nyctaginaceae -- Four-o'clock Family

Status: Endangered (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Shadscale, creosote bush.

Known distribution: Clark, Lincoln, and Nye counties, Nevada.

Remarks: These plants thrive on disturbed sites and colonize quickly.

APPENDIX B -- Watch List

OPUNTIA PULCHELLA Engelm. -- Cactaceae -- Cactus Family

Status: Threatened (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, shadscale.

Known distribution: Churchill, Esmeralda, Humboldt, Lander, Lyon, Mineral, Nye, Pershing, and Washoe counties, Nevada. Arizona and Utah.

Remarks: This cactus is widely distributed but not common at any one place.

PENSTEMON KECKII Clokey -- Scrophulariaceae -- Figwort Family

Status: Endangered (1975 and 1976 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Great Basin coniferous forest, Great Basin subalpine forest, alpine fell fields.

Known distribution: Clark County, Nevada.

Remarks: None.

PENSTEMON RUBICUNDUS Keck -- Scrophulariaceae -- Figwort Family

Status: Endangered (1975 and 1976 *FR*); threatened (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, shadscale, pinyon-juniper.

Known distribution: Douglas, Esmeralda, and Mineral counties, Nevada.

Remarks: This plant is more widely distributed than was originally thought.

PERITYLE MEGALOCEPHALA S. Wats. var. INTRICATA (Bdg.) Powell -- Asteraceae -- Sunflower Family

Status: Threatened (1975 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Shadscale.

Known distribution: Clark and Nye counties, Nevada. California.

Remarks: None.

PETERIA THOMPSONAE S. Wats. -- Fabaceae -- Pea Family

Status: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, shadscale, pinyon-juniper.

Known distribution: Nye County, Nevada. Arizona, Idaho, and Utah.

Remarks: This taxon is possibly more widely distributed in other states. It is not common in Nevada.

APPENDIX B -- Watch List

PHACELIA MUSTELINA Cov. -- Hydrophyllaceae -- Waterleaf Family

Status: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, pinyon-juniper, rocky slopes.

Known distribution: Nye County, Nevada. California.

Remarks: None.

PHACELIA NEVADENSIS J.T. Howell -- Hydrophyllaceae -- Waterleaf Family

Status: Endangered (Reno T/E Workshop, 2 Nov 1979); watch list (Mozingo and Williams).

Associated with: Possibly big sagebrush or pinyon-juniper.

Known distribution: Elko County, Nevada.

Remarks: This annual is only known from the original collection by Watson in the East Humboldt Mountains (Ruby Mtns.?), 6500 ft, July 1867.

PHACELIA PARISHII Gray -- Hydrophyllaceae -- Waterleaf Family

Status: Endangered (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, greasewood-saltbush.

Known distribution: Nye County, Nevada. California.

Remarks: Sometimes this annual is locally abundant. Illustrated in Abrams (1951) 3:513.

POLYGALA SUBSPINOSA S. Wats. var. HETERORHYNCHA Barneby -- Polygalaceae-- Milkwort Family

Status: Threatened (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 9 Feb 1979).

Associated with: Shadscale and creosote bush.

Known distribution: Nye County, Nevada. California.

Remarks: Var. *subspinosa* is illustrated in Abrams (1951) 3:22.

PSOROTHAMNUS KINGII (S. Wats.) Barneby (DALEA K.) -- Fabaceae -- Pea Family

Status: Threatened (1975 *FR*); endangered (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush.

Known distribution: Humboldt and Churchill counties, Nevada.

Remarks: Recent studies have proved this to be widely distributed in sandy areas.

APPENDIX B -- Watch List

SALVIA FUNEREA Jones -- Lamiaceae -- Mint Family

Status: Threatened (1975 *FR*); threatened (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Creosote bush.

Known distribution: Esmeralda and Nye counties, Nevada. California.

Remarks: Illustrated in Abrams (1951) 3:640.

THELYPODIUM LAXIFLORUM Al-Shehbaz -- Brassicaceae -- Mustard Family

Status: Endangered (Reno T/E Workshop, 25 Feb 1978); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, pinyon-juniper.

Known distribution: Lincoln and Nye counties, Nevada. Colorado and Utah.

Remarks: None.

TRIFOLIUM ANDERSONII Gray ssp. BEATLEYAE Gillett -- Fabaceae -- Pea Family

Status: Endangered (1975 and 1976 *FR*); watch list (Reno T/E Workshop, 2 Nov 1979).

Associated with: Big sagebrush, pinyon-juniper.

Known distribution: Douglas, Humboldt, Mineral, Nye, and Storey counties, Nevada. California.

Remarks: It is possible that some collections from other areas which have been simply labeled *Trifolium andersonii* may be referred to ssp. *beatleyae*.

ZIGADENUS VAGINATUS (Rydb.) J.F. Macbride -- Liliaceae -- Lily Family

Status: Watch list (Mozingo and Williams).

Associated with: Geothermal, greasewood-saltbush.

Known distribution: White Pine County, Nevada. Utah.

Remarks: Cronquist et al. (1977) treats this as a synonym of *Z. elegans* Pursh. However, Welsh (1979) considers *Z. vaginatus* to be a valid species.

APPENDIX C -- Plants deleted from further consideration in Nevada.

These plants may be threatened or endangered in other states, but they have been deleted from further consideration in Nevada.

ABRONIA ORBICULATA Standl. is a synonym of the widely distributed *A. turbinata* Torr. (CA, NV, OR)

ARABIS DISPAR Jones is widely distributed. (CA, NV)

ASTRAGALUS LENTIGINOSUS var. CHARTACEOUS Jones is not known from Nevada.

CAREX WHITNEYI Olney is not known from Nevada.

CASTILLEJA LINOIDES Gray is a high elevation form of the widely distributed *C. flava* S. Wats. (NV, UT)

CLAYTONIA MEGARHIZA var. BELLIDIFOLIA (Rydb.) C.L. Hitchc. is widely distributed. (NV, OR, WA)

CROTON WIGGINSII L.C. Wheeler is not known from Nevada.

CRYPTANTHA COMPACTA Higgins is not known from Nevada.

DITAXIS DIVERSIFLORA Clokey is a synonym of the widely distributed *Argythamnia cyanophylla* (Woot. & Standl.) Ingram. (see page 85)

DRABA LEMMONII var. INCRASSATA Rollins is not known from Nevada.

ERIOGONUM BEATLEYAE Reveal is widely distributed. (CA, NV)

ERIOGONUM DARROVII Kearney is widely distributed. (see page 185)

ERIOGONUM EREMICUM Reveal is not known from Nevada.

ERIOGONUM ESMERALDENSE var. TOIYABENSE J.T. Howell is widely distributed in Nevada.

HACKELIA SHARSMITHII Jtn. is widely distributed. (CA, NV)

HAPLOPAPPUS ABERRANS (A. Nels.) Hall is not known from Nevada.

HAPLOPAPPUS CANUS (Gray) Blake (*Hazardia c.*) is not known from Nevada.

HAPLOPAPPUS EXIMIUS H.M. Hall is widely distributed. (CA, NV)

HEUCHERA DURANII Bacig. is widely distributed. (CA, NV)

ISOETES BOLANDERI var. PYGMAEA (Engelm.) Klute is not known from Nevada. The specimen found floating in Walker Lake must have come down from the Sierra Nevada in California.

APPENDIX C -- Deleted Plants

LOMATIUM RAVENII Mathias & Constance is widely distributed. (CA, ID, NV, OR, UT)

MACHAERANTHERA AMMOPHILA Reveal is a synonym of the widely distributed *M. arida* Turner & Horne. (AZ, CA, NV, Mexico)

MACHAERANTHERA LEUCANTHEMIFOLIA (Greene) Greene is widely distributed. (see page 31)

NEOLLOYDIA JOHNSONII (Parry) Benson is widely distributed. (AZ, CA, NV, UT)

NITROPHILA MOHAVENSIS Munz & Roos is not known from Nevada.

PENSTEMON ABIETINUS Pennell is widely distributed. (NV, UT)

PENSTEMON DECURVUS Pennell is a synonym of the widely distributed *P. humilis* Nutt. (CA, NV, to OR, CO, UT, WY)

PENSTEMON LEIOPHYLLUS Pennell is widely distributed. (NV, UT)

PENSTEMON NANUS Keck is not known from Nevada.

PENSTEMON NYEENSIS Crosswhite is a synonym of the widely distributed *P. kingii* S. Wats. (ID, UT, NV)

PENSTEMON THURBERI var. ANESTIUS Reveal & Beatley is of dubious taxonomic validity. (see page 231)

PILOSTYLES THURBERI Gray is widely distributed. (AZ, CA, NV, TX, Mexico)

POLEMONIUM NEVADENSE Wherry is a synonym of the widely distributed *P. pulcherrimum* Hook. var. *pulcherrimum*. (CA, NV, to AL, MT, WY)

SENECIO LYNCEUS var LEUCOREUS (Greenm.) Blake is a synonym of the widely distributed *S. multilobatus* T. & G. (CA, NV, to UT, CO, AZ)

BIG SAGEBRUSH (Artemisia tridentata, Chrysothamnus nauseosus)

Artemisia papposa
Astragalus alvordensis
A. calycosus monophyllidius
A. convallarius finitimus
A. lentiginosus latus
A. oophorus lonchocalyx
A. porrectus
Camissonia nevadensis
Cryptantha hoffmannii
C. interrupta
Cymopterus corrugatus
Draba crassifolia nevadensis
D. douglasii
Eriogonum concinnum
E. rubricaule
Forsellesia pungens glauca
Frasera gypsicola
F. pahutensis
Galium hilendiae kingstonense
Gilia nyensis
Hackelia ophiobia
Helianthus deserticola
Hulsea vestita inyoensis
Lathyrus hitchcockianus
Lupinus holmgrenanus
L. malacophyllus
Mertensia toyabensis
Mimulus washoensis
Opuntia pulchella
Penstemon rubicundus
Peteria thompsonae
Phacelia inconspicua
P. mustelina
P. nevadensis
P. parishii
Psorothamnus kingii
Sclerocactus polyancistrus
S. pubispinus
Silene scaposa lobata
Trifolium andersonii beatleyae
T. lemmonii

LOW SAGEBRUSH (Artemisia arbuscula, A. nova [A. arbuscula var. nova])

Arabis dispar
A. shockleyi
Astragalus aequalis
A. beatleyae
A. serenoi sordescens
A. solitarius
A. toquimanus
A. yoder-williamsii
Coryphantha vivipara rosea
Eriogonum anemophilum
Lepidium nanum
Sclerocactus polyancistrus
Silene scaposa lobata
Townsendia jonesii tumulosa

GREASEWOOD-SALTBUSH (Sarcobatus vermiculatus, Atriplex spp., Suaeda torreyana, Distichlis spicata stricta)

Astragalus lentiginosus sesquimetralis
A. phoenix
A. porrectus
A. pterocarpus
A. serenoi sordescens
A. solitarius
Cymopterus corrugatus
Eriogonum desertorum undescribed var.
E. ovalifolium undescribed var.
E. rubricaule
Oryctes nevadensis
Penstemon arenarius
Phacelia glaberrima
P. parishii

GEOTHERMAL (usually surrounded by GREASEWOOD-SALTBUSH or SHADSCALE)

Astragalus lentiginosus sesquimetralis
Castilleja salsuginosa
Eriogonum argophyllum
E. ovalifolium undescribed var.
Fimbristylis thermalis
Zigadenus vaginatus

SHADSCALE (Atriplex confertifolia, Grayia spinosa, Artemisia spinescens)

Agave utahensis eborispina
A. utahensis nevadensis
Arabis shockleyi
Arctomecon merriamii
Asclepias eastwoodiana
Astragalus alvordensis
A. callithrix
A. cimae cimae
A. funereus
A. musimonum
A. phoenix
A. porrectus
A. pseudiodanthus
A. serenoi sordescens
A. solitarius
A. toquimanus
A. uncialis
Brickellia knappiana
Calochortus striatus
Camissonia megalantha
Centaurium namophilum
Cordylanthus tecopensis
Cymopterus ripleyi saniculoides
Enceliopsis nudicaulis corrugata
Ephedra funerea
Eriogonum argophyllum
E. bifurcatum
E. concinnum
E. lemmonii
Gilia nyensis
Hazardia brickellioides
Helianthus deserticola
Ivesia eremica
Lathyrus hitchcockianus
Machaeranthera grindelioides depressa
Mentzelia leucophylla
Mirabilis pudica
Opuntia pulchella
Oxytheca watsonii
Penstemon arenarius
P. fruticiformis amargosae
P. rubicundus
Phacelia beatleyae
Perityle megalocephala intricata
Peteria thompsonae
Polygala subspinosa heterorhyncha
Sphaeralcea caespitosa

CREOSOTE BUSH (Larrea tridentata, Ambrosia dumosa)

Arctomecon californica
A. merriamii
Astragalus geyeri triquetrus
A. lentiginosus micans
A. mohavensis hemigyrus
A. nyensis
Brickellia knappiana
Ephedra funerea
Eriogonum viscidulum
Ferocactus acanthodes
Gilia ripleyi
Linanthus arenicola
Mirabilis pudica
Opuntia whipplei multigeniculata
Penstemon bicolor varieties
P. fruticiformis amargosae
Phacelia beatleyae
Polygala subspinosa heterorhyncha
Salvia funerea
Sclerocactus polyancistrus

BARREN FLATS, KNOLLS, or ROCKY SLOPES

Arctomecon californica
A. merriamii
Artemisia papposa
Astragalus alvordensis
A. beatleyae
A. funereus
A. phoenix
A. tephrodes eurylobus
Calochortus striatus
Cryptantha insolita
Cymopterus basalticus
Draba sphaeroides cusickii
Enceliopsis nudicaulis corrugata
Epilobium nevadensis
Erigeron latus
E. ovinus
Eriogonum argophyllum
E. lemmonii
E. lobbii robustum
E. rubricaule
E. ovalifolium undescribed var.
Frasera gypsicola
Galium hilendiae kingstonense
Hackelia ophiobia
Hazardia brickellioides
Ivesia eremica
Lepidium nanum
Lesquerella hitchcockii
Lewisia maguirei
Mentzelia leucophylla
Opuntia whipplei multigeniculata
Penstemon pahutensis
Phacelia beatleyae
P. mustelina

HABITATS AND ASSOCIATIONS

BARREN ROCKY OUTCROPS

Arenaria stenomeres
Erigeron uncialis conjugans
Gilia ripleyi
Haplopappus watsonii
Primula nevadensis
Smelowskia holmgrenii

MOUNTAIN BRUSH (Cercocarpus ledifolius, Amelanchier sp.)

Angelica scabrida
Cirsium clokeyi
Coryphantha vivipara rosea
Cryptantha tumulosa
Mertensia toyabensis
Penstemon moriahensis
P. pudicus
P. thompsoniae jaegeri

PINYON-JUNIPER (Pinus monophylla, Juniperus osteosperma)

Agave utahensis eborispina
A. utahensis nevadensis
Arabis dispar
A. shockleyi
Asclepias eastwoodiana
Astragalus aequalis
A. beatleyae
A. calycosus monophyllidius
A. convallarius finitimus
A. lentiginosus latus
A. mohavensis hemigyrus
A. musimonum
A. oophorus clokeyanus
A. oophorus lonchocalyx
A. serenoi sordescens
A. toquimanus
Coryphantha vivipara rosea
Cryptantha hoffmannii
C. interrupta
C. tunulosa
Draba sphaeroides cusickii
Eriogonum concinnum
E. lobbii robustum
Forsellesia pungens glabra
Frasera pahutensis
Galium hilendiae kingstonense
Geranium toquimense
Gilia nyensis
Haplopappus watsonii
Hulsea vestita inyoensis
Lewisia maguirei
Lupinus holmgrenanus
Machaeranthera grindelioides depressa
Penstemon pahutensis
P. pudicus
P. rubicundus
Peteria thompsonae
Phacelia anelsonii
P. inconspicua
P. mustelina
P. nevadensis
Silene scaposa lobata
Sclerocactus polyancistrus
S. pubispinus
Streptanthus oliganthus
Thelypodium laxiflorum
Trifolium andersonii beatleyae
Viola purpurea charlestonensis

MEADOWS (Carex sp., Juncus sp., grasses)

Antennaria arcuata
Calochortus striatus
Centaurium namophilum
Cordylanthus tecopensis
Draba stenoloba ramosa
Fimbristylis thermalis
Synthyris ranunculina

RIPARIAN (sometimes Salix spp., Populus spp.)

Astragalus robbinsii occidentalis
Centaurium namophilum
Cordylanthus tecopensis
Draba paucifructa
D. stenoloba ramosa
Elodea nevadensis
Fimbristylis thermalis
Fraxinus cuspidata macropetala
Grindelia fraxino-pratensis
Rorippa subumbellata
Thelypodium sagittatum ovalifolium

HABITATS AND ASSOCIATIONS

GREAT BASIN CONIFEROUS FOREST or YELLOW PINE FOREST
(Pinus ponderosa, Abies concolor)

Angelica scabrida
Cirsium clokeyi
Draba sphaeroides cusickii
Epilobium nevadense
Erigeron ovinus
E. uncialis conjugans
Eriogonum lobbii robustum
Lesquerella hitchcockii
Penstemon keckii
P. moriahensis
P. thompsoniae jaegeri
Phlox gladiformis
Townsendia jonesii tumulosa
Viola purpurea charlestonensis

GREAT BASIN SUBALPINE FOREST (Pinus longaeva, P. flexilis, Picea engelmannii)

Antennaria soliceps
Arenaria kingii rosea
Cirsium clokeyi
Draba jaegeri
D. paucifructa
Ivesia cryptocaulis
Lesquerella hitchcockii
Penstemon francisci-pennellii
P. keckii
P. thompsoniae jaegeri
Primula nevadensis
Sphaeromeria compacta
Synthyris ranunculina
Townsendia jonesii tumulosa

SIERRAN SUBALPINE FOREST (Pinus monticola, P. albicaulis, Tsuga mertensiana)

Draba asterophora asterophora
Lupinus montigenus

ALPINE FELL FIELDS (meadows with grasses and perennial herbs, scree)

Antennaria soliceps
Cymopterus goodrichii
C. nivalis
Draba arida
D. crassifolia var. nevadensis
D. jaegeri
Eriogonum holmgrenii
E. ovalifolium caelestinum
Geranium toquimense
Haplopappus alpinus
Ivesia cryptocaulis
Lesquerella hitchcockii
Penstemon keckii
P. procerus modestus
Primula capillaris
Silene clokeyi
Sphaeromeria compacta

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LEAF SHAPES

OVATE

OBOVATE

LANCEOLATE

OBLANCEOLATE

LIGULATE

OBLONG

LINEAR

CUNEATE

SEXUAL SYMBOLS

♂ Male

♀ Female

INFLORESCENCE TYPES

RACEME

UMBEL

PANICLE

GLOSSARY

Although we have made an attempt to keep scientific terminology to a minimum, a few easily understood and defined terms were used for sake of brevity and clarity of expression in the plant descriptions. These are defined below. No attempt was made to characterize the various kinds of hairiness or pubescence according to conventional botanical expressions since, in those instances where a particular kind of pubescence was a critical point, a simple descriptive phrase seemed to suffice. The illustrations accompanying the glossary will provide an understanding of those terms applied to various leaf geometries. These terms may be applied to other laminar structures as well.

acuminate -margins relatively straight to convex and coming to a point enclosing an angle of less than 45°.

achene -a one-seeded dry fruit, generally small, which does not split open at maturity.

alternate -only one leaf at each node on the stem.

appressed -pressed closely to the surface as if flattened out, frequently used to refer to pubescence with a "plastered down" appearance.

caespitose -"cushion" plants, short and much branched.

calyx -the lowermost whorl of flower parts, frequently, but not always green.

capsule -a dry fruit which splits open at maturity to release the seeds.

caudex -a perennial stem which is short, thick, and vertical, either at ground level or buried in the soil.

ciliate -with hairs around the margins.

compound -obviously divided up into smaller parts, as, for example, the leaf of an ash.

corolla -the whorl of petals situated above the sepals in a flower.

cuneate -wedge-shaped or triangular.

disk flower -the tubular flowers at the center of the "head" of a composite inflorescence, e.g., the yellow flowers in the center of a daisy.

elliptic -elongated with the margins uniformly curved and the widest axis at midpoint.

emarginate -with a notch at the apex.

exfoliating -peeling off in strips or sheets.

filament -the supporting stalk of the stamen. It is topped by the pollen producing structure, the anther.

glabrous -hairless, without pubescence.

glandular -having small secretory structures, usually appearing as a terminal swelling on a hair, but occasionally sessile.

head -a dense globular or flattened cluster of sessile flowers on the flowering stalk or peduncle.

inflorescence -the branched or unbranched stem with flowers distributed along the axis.

GLOSSARY

internode -that segment of the stem between the attachment point of two leaves.

involucral bract -a leaf-like or scale-like structure below the actual flower.

involucre -a whorl of involucral bracts subtending a flower cluster, a characteristic feature of the Sunflower Family.

lanceolate -much longer than broad, shaped like a lance with the widest part below the middle.

leaflet -a segment of a compound leaf.

linear -long and narrow with a uniform width, e.g., a grass blade.

node -that segment of the stem where the leaf is attached.

nutlet -a small dry, hard nut-like seed or fruit.

oblanceolate -like lanceolate, but with the widest point above the middle and tapering to the base.

oblong -longer than broad with the margins parallel or nearly so.

obovate -egg-shaped in outline, with the widest axis above the middle.

obtuse -blunt or rounded at the apex.

opposite -with two leaves at the same node on the stem on opposite sides.

ovary -that part of the female reproductive structure, or pistil, which contains the seeds.

ovate -egg-shaped, with the widest axis below the middle.

panicle -a branched flowering stem, essentially leafless.

pappus -a crown of hairs or scales at the top of an achene.

pedicel -the stalk supporting a single flower.

peduncle -the main stalk of an entire inflorescence.

perennial -living longer than two years.

perianth -calyx and corolla combined.

petal -a segment of the corolla.

petiole -a leaf stalk.

pinnate -compound, with the leaflets arranged on both sides of a common axis.

pistil -the female reproductive structure of the flower.

pod -any dry fruit which splits open to release the seeds at maturity.

prostrate -lying flat or trailing.

pubescent -hairy.

raceme -an unbranched inflorescence with the flowers on individual stalks arranged along a main axis.

rachis -the main axis of a compound leaf.

GLOSSARY

ray	-a secondary branch of an umbel; one of the strap-shaped flowers at the margin of a head in the Sunflower Family.
reniform	-kidney-shaped.
sepal	-a segment of the calyx.
sessile	-without a supporting stalk.
spatulate	-rounded at the apex and oblong or obovate with a tapered base.
stamen	-the male reproductive structure of the flower.
stellate	-star-shaped.
stigma	-the apical, pollen receptive portion of the pistil.
stipule	-paired blade-like structures or scales at the base of a petiole.
style	-the stalk on top of the ovary which supports the stigma.
tap root	-a primary root which is persistent and usually unbranched, but producing lateral rootlets.
tomentose	-pubescent with short, dense matted hairs.
umbel	-a flat-topped or convex inflorescence with all of the pedicels originating at a common point.

INDEX

RECOMMENDED STATUS: E = endangered, T = threatened, W = watch list, P = possibly extinct, D = deleted

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